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PART II.—THE MOUNTING, &c.

PLATES.

PART I.

GUN.

PART II.

MOUNTING.

GUN, VICKERS, ·303-INCH.

NOMENCLATURE OF PARTS OF GUN.

1. The following is the nomenclature of parts of the gun :—

Lock.—Consisting of casing ; side levers, axis bush and split keeper pin ; extractor levers right and left ; extractor ; gib ; gib spring and cover ; sear and spring ; trigger and axis pin ; tumbler and axis pin ; firing pin ; lock spring.

Block, feed.—Consisting of body ; slide ; top and bottom levers and split fixing pin ; top and bottom pawls (front and rear) ; springs and axis pins.

Rear crosspiece.—Consisting of body ; T-fixing pin ; joint pin, check nut and keeper pin ; firing lever with pawl and axis pin ; trigger bar lever ; safety catch, axis pin, spring with piston ; milled heads with oil brushes and leather washers.

Box, fusee spring.—

Spring, fusee.—Including fittings.

Screw adjusting fusee spring.—Including vice pin.

Fusee.—With chain and fixing pin.

Plate, side, right.—Including side plate spring.

Plate, side, left.—Including side plate spring.

Crank.—Including crank pin and fixing pin.

Rod, connecting.—Including adjusting nut and six washers; three No. 1 (·003-inch); three No. 2 (·005-inch).

Handle, crank.—Including fixing pin.

Barrel.—With asbestos packing.

Sight, tangent.—Consisting of stem; graduated plate and upper and lower fixing screws; slide; pinion; pawl and fixing pin; slide spring; milled head and fixing screw; axis pin; tangent sight spring and piston.

Cover, rear.—Consisting of cover; cover lock, axis pin and spring; trigger bar and spring; cover joint pin with check nut and keeper pin.

Cover, front.–

Casing, barrel.—Consisting of casing; steam tube with slide valve and keeper screw; packing gland*; asbestos packing; two screwed plugs each with link, S-hook and stud; protector for condenser boss with chain and swivel; plug, cork, with chain and two S-hooks.

Sight, fore.—

Casing, breech.—Consisting of casing; check lever, keeper pin, piston and spring; sliding shutter with catch, keeper pin, spring and plunger; slide left; slide right with roller, collar and split fixing pin; front cover catch, keeper pin, plunger, plug and spring.

Muzzle attachment for ball-firing.—Consisting of casing, outer, with split keeper pin, chain, S-hook and stud; disc; cone, front; cup, muzzle, with clamping screw; and gland.

N.B.—Casings, breech and barrel, are riveted together and cannot be separated.

* When the muzzle attachment is used this is kept in the spare parts box.

GENERAL DESCRIPTION.

2. Weight of gun 28½ lbs. (including muzzle attachment weighing about 1 lb.); 38½ lbs. with water in casing.

3. The gun may be considered to be divided into two portions, the non-recoiling and the recoiling. It is worked automatically by two forces (1) the explosion of the charge (2) a strong spring (called the fusee spring).

Non-recoiling Portion.

4. The non-recoiling portion consists of the barrel casing and breech casing, and is attached to the mounting by the crosshead and elevating joint pins.

5. The *barrel casing* is of steel with longitudinal corrugations the interior being tinned to prevent rust. It has three openings, one on the upper right side near the breech for filling, one underneath near the muzzle for drawing off the water, and the third (also near the muzzle) for allowing the steam, but not the water, to escape. The first two are closed with screwed plugs; the last is open and connected with the steam tube.

6. A *cork plug* is provided which can be inserted in the steam escape hole when the gun is travelling, in order to prevent waste of water from jolting. The plug should always be taken out before commencing to fire, and put in again before the gun changes position. The cork plug fits into a special fitting made to receive the tube connected with a condenser. This fitting is provided with a protector to be used when the condenser is not connected to the gun.

7. The front end of the barrel casing contains a *gunmetal guide* to lead the barrel through the front of the barrel casing, when the barrel is being replaced after stripping.

It forms a bearing for the barrel, and at the same time a seating for the asbestos packing.

8. To prevent the escape of water, there is at the forward end of the barrel casing *asbestos packing*, which is held in position round the barrel by the packing gland. At the rear end of the barrel there is a cannelure, also filled with asbestos packing, which prevents the escape of water.

9. The *steam tube*, which is of brass, consists of a fixed tube and an outer tube, termed the slide valve, so arranged as to slide freely along the fixed tube. In the fixed tube there is a hole near each end, and a third hole in the threaded portion in front, which connects with the steam escape hole by a tube attached to the interior of the barrel casing. The steam tube is screwed into the front end of the barrel casing, and is retained in position by a keeper screw, which ensures that the third hole coincides with the steam escape hole. At the breech end it fits into a thimble fixed to the rear end of the barrel casing.

If the gun is fired with elevation, the valve slides backwards and, closing up the hole at the rear end of the tube, prevents the water entering ; at the same time it leaves the front hole uncovered, which, being above the water level, allows the steam to enter the tube and escape through the steam escape hole in the barrel casing. Similarly, if the gun is fired with depression, the valve slides forward and allows the steam, but not the water, to escape through the rear hole. When the gun is horizontal, either one or both holes are uncovered by the valve.

10. The *foresight* is blade-shaped in design. It is protected by side wings formed on the block fixed to the barrel casing, in which the foresight dovetails. There is an opening in the right wing through which the foresight is assembled, and a punch hole in the left wing for adjusting and removing.

11. The *breech casing*, which is riveted to the barrel casing, consists of two outside plates (right and left) and a bottom plate. It is closed at the top by the two covers, front and rear, and at the end by the rear crosspiece.

There is an opening in the bottom plate through which the empty cartridge cases fall to the ground. This opening has a sliding shutter which, when shut, prevents dirt, &c., entering the gun. *The shutter must be moved to the rear before the gun can be loaded.* If the shutter is closed after loading, one shot only can be fired, but the empty case will remain in the breech casing and another cartridge will be fed up ; the extractor dropping on to the shutter will prevent the lock going forward.

There is a seating for ejection on the bottom of the barrel casing which ensures the empty case being knocked off the extractor should it fail to drop off before the extractor is in a position to rise.

12. On the outside of the right-hand plate is the *check lever*, which pivots on a stud and is secured by a keeper pin. The stud has a groove cut in it to allow for the movement of the check lever and pin. The check lever has a small spiral spring and piston inside it which bear against a second stud and, by their action, force the check lever over, thus causing the crank handle to be momentarily held down while the breech is closed.

13. On the outside of the left-hand plate are two *studs* for holding the front end of the fusee spring box. There is also on the underside an *elevating stop*, without which it is possible for the bracket head of the mounting to damage the fusee spring box. Both plates have openings in the rear end, partly closed by *slides*, in which the crank bearings move.

The right slide carries the roller, collar, and split fixing pin ; the left slide has a stud for holding the rear end of the fusee spring box.

14. On the inside of both plates are *cams*, which control the path of the extractor. These cams have a step cut in each, on the rear sloping surface. These steps are for the purpose of preventing the lock going forward if, owing to insufficient recoil, the recoiling portions do not come back far enough to allow the extractor to drop. They are also the means of hanging the lock (see para. 57).

15. The outside plates are connected at the rear end by the *rear crosspiece*, which is hinged at the bottom by a screwed joint pin. This piece is fitted with handles of wood, inside which are steel cylinders for carrying oil closed by milled heads fitted with brushes; firing lever with thumb piece; trigger bar lever; safety catch; and safety catch piston and spring, which also actuates the trigger bar lever.

The upper end of the rear crosspiece is fixed in position by a T-shaped screwed pin, which passes through the outside plates from left to right. The pin acts also as an axis pin for the trigger bar lever and a tool for stripping the lock and other parts of the gun. The trigger bar lever draws back the trigger bar by the action of a pawl on the firing lever which presses forward its lower end.

16. The two *covers* are both hinged on one joint pin attached to the outside plates just behind the feed block. The pin is secured by a check nut with a keeper pin. The joint also forms a tie for the outside plates.

17. The front cover is secured by a *catch* which must be turned up to open it. This catch, when down, is kept in position by a plunger and spring. There is on the underside of the front cover at its rear end an extractor stop. This, together with the stop on the lock casing, prevents the extractor from rising too high.

18. On the top of the rear cover, about $\frac{1}{2}$-inch from the rear end of the breech casing, is the *tangent sight* which is positioned by a piston and spring. The sight, when down,

rests on a bridge, which is solid with the rear cover and strengthens it. The sight is of "U" pattern.

The tangent sight consists of stem, a plate graduated up to 2,900 yards (Mark VI ammunition, 2,800 yards), and slide. Running through the centre of the slide is a pinion, the teeth of which work in the rack on the stem. A pawl is secured to the pinion by a fixing pin. On the underside of one end of the pawl are teeth, which engage in the circular rack on the slide.

When the slide is at rest the stud on the inside of the milled head (nearest the slot for the slide spring) bears on the stud on the pawl immediately over the teeth, being actuated by the slide spring, and thus forcing the teeth into the circular rack. This keeps the slide stationary on the stem. On rotating the milled head, this stud is partly disengaged from the stud on the pawl, thus permitting a second stud on the milled head to press on one side of the V-shaped ramp at the other end of the pawl. This action releases the teeth sufficiently to permit of the pawl being moved round the circular rack by the action of the stud bearing on one side of the V-shaped ramp on the pawl; this moves the slide along the stem. On releasing the milled head, the spring positions the cover, thus causing the stud on the pawl to become once more engaged with the stud on the milled head and to force the teeth into the rack.

19. The *rear cover lock* is actuated by a flat spring on the inside of the cover and has to be lifted to open.

20. The rear cover and rear crosspiece are grooved to fit over the edges of the breech casing, so that when the rear crosspiece screwed T-fixing pin is home and the cover locked, these, with the assistance of the screwed cover joint pin, keep the casing and cover rigid.

21. The *trigger bar* slides inside the rear cover. It has a

lug on the right, against which the trigger bar spring bears, and a projection on its rear end which engages the bent of the trigger bar lever. In its front end is a slot which allows the top of the trigger to pass when the lock is moving backward and forward. The block which closes the front end of the slot engages with the top of the trigger and draws it back when the trigger bar is drawn backwards by pressure on the firing lever.

22. There are also two *ramps* fixed inside the rear cover which force the extractor down on recoil, and guides, which assist in keeping the lock down.

23. The *muzzle attachment for ball firing* is provided to assist recoil. It is screwed into the packing gland seating at the front end of the barrel casing, the end portion acting as the gland.

The outer casing is a hollow cylinder screwed internally at the front end to receive the front cone and bored and grooved at the rear end to form an inner divided flange for the connection and retention of the gland which has an outer flange correspondingly divided for engagement.

Vent holes for the escape of gases are cut near the front end of the casing.

A split pin is attached to the outer casing by means of a chain connection. The pin can be entered in either of three holes bored equi-distantly in the outer casing for engagement with either of three corresponding holes in the gland when the casing is home in position on the gland.

The disc is placed in the front end of the outer casing and is pressed home and held in position by the front cone.

The muzzle cup is bored at the rear end to fit on to the end of the barrel. This end of the cup is split and is arranged to receive a transverse clamping screw for fixing the cup rigidly to the barrel.

The gland and front cone have flanges which are grooved

to receive the combination tool provided for assembling and stripping purposes.

Recoiling Portion.

24. The recoiling portion (which is mounted inside the non-recoiling portion) consists of a barrel and two side plates, which carry the crank and lock.

25. The *barrel* is browned and has a groove round it near the muzzle for the clamping screw of the muzzle attachment, a flat being cut in front of the groove to allow the attachment to be assembled. At the breech end it is formed with a square block, from which project two studs (one at each side) called the barrel trunnions. By means of these trunnions the barrel is connected to the side plates.

The front of the barrel block bears against the face of the barrel bearing in the barrel casing.

26. The *side plates* are both bored to receive the barrel trunnions, and have guides, along which the flanges of the lock move. These guides have two interruptions on each side to enable the lock to be lifted out. In addition, each side plate has a bearing through which the crank passes, thus connecting the latter with the barrel ; these bearings move in slots in the breech casing.

27. Both side plates are fitted with *side plate springs* to ensure that the horns of the extractor do not drop below the solid cams during the backward movement of the lock when there are no cartridges on the extractor.

28. The left side plate is prolonged to the front, and has a recess in which the bottom lever of the feed block engages.

29. The *crank* is fitted with a connecting rod, which is free to rotate on the crank pin, and, outside the breech casing on the right, with a curved handle, the upper surface of which bears on the roller when the gun is firing. On the left it is

fitted with a fusee to which is attached a chain of two links, by means of which it is connected to the fusee spring.

30. The *connecting rod* is attached to the crank by means of an axis pin called the crank pin, and is arranged to take the lock by means of an interrupted flange, thereby connecting the crank and lock. It has an adjusting nut and washers are provided which enable its length to be increased. By this means the space between the extractor and the barrel for the base of the cartridge is kept within safe limit, thus preventing separations.

31. On the left of the breech casing there is a strong spiral spring called the *fusee spring*, the rear end of which is connected by the fusee chain and fusee with the crank ; the front-end is attached to the breech casing by means of the fusee spring box and adjusting screw, which passes through the front end of the fusee spring box, and through the nut at the front end of the spring.

The fusee spring can be adjusted without removing the box, as the vice pin of the screw is loose. This screw is kept in position by two nibs which enter recesses in the front end of the fusee spring box and are retained by the tension of the fusee spring. The fusee is attached to the crank by means of a stem and lugs and is easily removed.

32. The *lock* is attached to the connecting rod by the side lever head, and when in the firing position closes the breech. In this position it is held by the side levers, the crank (fixed in bearings in the side plates), and the connecting rod, which are all slightly below the horizontal to prevent the breech being opened at the moment of firing. The lock has a reciprocating motion communicated to it by the rotation of the crank, and is kept in position during its backward and forward movements by means of flanges working along guides on the side plates, and by the guides on the underside of the rear cover.

33. The *lock casing* has a piece riveted inside at the top of the front face, which acts as a guide for the lock spring when assembling, and also forms a seating for the spring. Its sides are drilled for the various axis pins, and on its underside it has flanges which work on the guides on the side plates. The lower of these flanges has interrupted portions to agree with those in the guides and allow the lock to be removed from the gun.

34. The *extractor* is attached to the front end of the lock by guide ribs, upon which it slides, and contains the gib.

The projections on the gib, together with the cartridge grooves, form recesses which retain the cartridge in position.

35. The extractor is moved upwards by means of the *side* and *extractor levers*. The upward and downward movements of the extractor are regulated by guide ribs and stops ; the top stop on the face of the lock casing acting in conjunction with the stop on the underside of the front cover limits the upward travel of the extractor, while the bottom stops, formed on the sides of the lock casing, limit its downward travel by intercepting the extractor levers.

36. The *feed block* is of steel and fits under the front cover into a recess cut in the breech casing. It is provided with a slide to which are attached two pawls with spring for the purpose of moving the cartridges from right to left. These pawls are made with finger pieces and can be pressed down together, releasing the pawls from the belt. The slide has a transverse motion given to it by means of two levers which are fitted together ; the top lever has a stud which engages a slot on the slide, and on the bottom lever is a stud which engages in the recess in the left side plate ; by this means the slide is connected with the recoiling portion. The feed block has also two stationary lower pawls which are connected by a finger piece, and which engage under the succeeding cartridge and prevent the belt slipping backwards during

firing. The feed block is provided with guides fitted above and below in the cartridge way, which ensure the cartridges coming to the exact position where they can be gripped by the extractor ; they are prevented from being pushed too far through to the left by means of the cartridge and bullet stops, which are inside the feed block.

37. The gun is supplied with cartridges from a *belt* which passes from right to left through the feed block. This belt is formed by two pieces of webbing connected together by eyelets and brass strips of two lengths, the projecting strips showing how far the cartridge should be inserted ; the belt is made thick at the edge next the bullets by being folded over a piece of cord, so that the cartridges may be kept parallel in passing through the feed block, and lie evenly in the ammunition belt boxes.

ACTION OF MECHANISM.

38. It is not alone sufficient for a high standard of knowledge of mechanism to be reached ; it must also be maintained, and therefore instruction should be continuous throughout the year, for it is easily forgotten if neglected.

39. A theoretical knowledge of the mechanism is not sufficient. Instruction must be so thorough and practical as to ensure that all mechanical operations are performed correctly from force of habit, so that they will be carried out instinctively in moments of excitement.

Note.—(i) A belt and dummy cartridges will invariably be used for purposes of instruction. (ii) A service lock must always be in the gun, when firing either ball or blank ammunition. For instructional purposes, when ammunition is not being fired the D.P. (instructional) lock should be used in the gun whenever possible.

40. The following is the correct sequence in which instruction in mechanism should be given ; each stage must be thoroughly understood before proceeding to the next.

LOADING.

41. *To Load the Gun.*—(*a*) Pass the tag end of the belt through the feed block from the right side ; (*b*) with the right hand pull the crank handle on to the roller ; (*c*) with the left hand pull the belt through to the left front as far as it will go ; (*d*) let go the crank handle. The first cartridge will then be gripped by the extractor. Repeat the above and, when this has been done, the first cartridge will be in the chamber, and another gripped by the upper part of the extractor. The gun is then ready for firing.

42. On raising the safety catch and pressing the thumb piece of the firing lever the gun will fire automatically until pressure is released. The lock will then be home, and the extractor will be gripping (*a*) a live cartridge in the feed block and (*b*) a live cartridge in the chamber.

EFFECT OF THE FORCE OF THE EXPLOSION OF THE CHARGE AND OF THE FUSEE SPRING.

43. Suppose the gun to have just fired the first cartridge in the belt ; the extractor will be gripping the second live cartridge in the feed block and the empty case, which has just been fired, in the chamber ; the explosion will cause the recoiling portion to move backwards through a distance of about one inch, thereby extending the fusee spring.

This backward movement is due partly to recoil and partly to the effect of the ball-firing attachment which acts as follows—The powder gases which escape from the muzzle after the exit of the bullet strike violently against the front

cone and rebound on to the front face of the muzzle cup, driving it and the barrel, to which it is attached, backwards. The gases then escape into the air through the openings in the outer casing.

44. *Action in the Feed Block.*—The recess in the prolongation of the left side plate by means of the stud actuates the bottom lever of the feed block. The bottom lever acts on the top lever, which moves the slide and the top pawls to the right, to engage behind the cartridge held in place by the bottom pawls.

45. *Rotation of the Crank.*—The backward movement of recoil causes the tail of the crank handle to roll against the roller, thereby rotating the crank. The rotation of the crank draws back the lock and causes the fusee to wind the fusee chain, thus further extending the fusee spring. The continued rolling of the crank handle against the roller assisted by the fusee spring forces the whole of the recoiling portions forward again, with the exception of the lock, which continues its backward movement for a short distance before it joins in the forward movement. As the recoiling portions go forward, the recess in the prolongation of the left side plate actuates the bottom lever of the feed block. This bottom lever acts on the top lever, which moves the slide and the top pawls to the left, the pawls thus bringing the third cartridge in the belt to a position against the cartridge and bullet stops, ready to be gripped by the extractor. The belt, as it moves to the left, slides over the bottom pawls, which are depressed as the cartridge passes over them, and rise behind the fourth cartridge, holding the belt in position and preventing it from sliding back after the second cartridge has been withdrawn by the extractor.

46. *The Lock.*—As the lock moves backwards the extractor withdraws the empty case from the chamber and a live cartridge from the belt in the feed block. The horns of the

extractor move along the upper surface of the solid cams until the cartridge is clear of the belt. When the extractor arrives at the rear end of the cams it is forced down by the ramps in the cover, thus bringing the cartridge drawn from the feed block in line with the chamber, and causing the empty case drawn from the chamber to fall off the extractor. The live cartridge is prevented from slipping down the face of the extractor by the bottom projection of the gib. (If the empty case does not fall off when the extractor drops, it will be forced off by the seating for ejection on the bottom of the barrel casing when the extractor rises.)

47. *Cocking Action.*—The rotation of the crank gives an upward motion to the connecting rod and side lever head, which latter, bearing on the tail of the tumbler, rotates it on its axis, and thus forces the firing pin to the rear. The long arm of the lock spring acts on the projection of the firing pin, while the short arm bears against the nose of the trigger ; consequently the withdrawal of the firing pin compresses the lock spring by drawing the long arm towards the short arm. As the tumbler rotates, the nose of the trigger is forced by the short arm of the lock spring under the bent of the tumbler, and the continued motion of the tumbler forces the firing pin still further back, until the bent of the sear (which is actuated by the sear spring) is forced into the bent of the firing pin and retains it. The firing pin is thus prevented from flying forward.

48. *Action of the Fusee Spring.*—When the force of the explosion is expended, the action of the fusee spring comes into play, continuing the forward movement of the barrel and side plates, and unwinding the fusee chain from the fusee. This gives the crank a rotary motion, which forces the connecting rod and side lever head downwards, causing the lock to continue the forward movement (*see* para. 45) and place the live round in the chamber. The extractor is

moved upwards by the side levers acting on the extractor levers. The bottom projection of the gib slides over the base of the live cartridge in the chamber and the top projection of the gib slides over the base of the cartridge which has been automatically moved up into position in the feed block. The firing pin hole is thus brought opposite the cap.

49. As soon as the extractor reaches its highest position, the side plate springs engage in grooves in its sides to prevent the horns falling below and fouling the front end of the solid cams in the breech casing at the commencement of the backward movement, when (*a*) the side levers are released from the extractor levers (*b*) the side or extractor levers are worn. This, however, can only occur when there are no cartridges on the face of the extractor.

50. The further downward movement of the connecting rod and side lever head, causes the lock to be forced slightly further forward, and the breech is then closed. During this movement steps on the side levers travel over bents on the extractor levers.

51. *Firing Action.*—(*a*) For the first shot. As the side lever head is brought slightly below the horizontal, it depresses the sear, thereby disengaging it from the firing pin, which then moves slightly forward until the bent of the tumbler engages the nose of the trigger. If the safety catch is raised and the thumb piece on the firing lever pressed, the pawl near the bottom of the firing lever pushes forward the bottom of the trigger bar lever. This, being pivoted in the centre, causes the top to come to the rear, engaging a projection on the trigger bar and drawing it to the rear. As the trigger bar is drawn backwards, the front end of the slot engages and draws back with it the tail of the trigger, thereby releasing the tumbler. The long arm of the lock spring then propels the firing pin on to the cap and the cartridge is exploded.

(*b*) For subsequent shots. The firer, by maintaining pressure on the thumb piece, holds back the trigger bar. Therefore, each time the lock goes forward the front end of the slot holds back the tail of the trigger before the lock is quite home. By this means the nose of the trigger is prevented from engaging in the bent of the tumbler. When the lock is home, the side lever head depresses the sear, thus permitting the long arm of the lock spring to carry the firing pin on to the cap, and the charge is exploded.

The depression of the sear is so timed that the firing pin cannot be released until the lock is in the firing position.

52. On releasing the thumb piece, the short arm of the lock spring forces the nose of the trigger under the bent of the tumbler, so that, when the sear is depressed, the nose of the trigger engages in the bent of the tumbler, and the firing pin is unable to go forward.

Unloading.

53. *To unload the Gun.*—Pull the crank handle on to the roller twice in succession (without pulling the belt), letting it fly forward to the check lever each time; release the top and bottom pawls and remove the belt from the feed block —then release the lock spring.

MACHINE, FILLING BELTS, MAXIM ·303-INCH, MARK II.

(Plate IX.)

Belt-Filling Machine.

54. *Description.*—The belt filling machine is designed to place the cartridges expeditiously and evenly in the ammuni-

tion belts, and is constructed so that it may be readily clamped on to the most convenient place.

The chief parts are the bed plate, pocket opener, removable crank handle with fixing pin and chain, crank, connecting rod, cam bar, hopper, traversing gear, hinged loading tray, and hinged leg.

In the Mark I machine the crank handle is not made removable; also the loading tray and leg are not made to fold in the centre.

Weight of machine complete with hopper, 19 lbs.
" " loading tray and leg, $4\frac{3}{4}$ lbs.

55. *Instructions for use.*—The machine must be fixed, so that the crank handle can be worked with the right hand. The loading tray and the leg should be unfolded. The leg should be made rigid by turning up the keeper plate on to the pin catch, and the loading tray secured to the left of the bed plate by means of the pin, which is attached by a chain to the former. Turn the steel guide plate on the bed plate outwards; see that the pocket opener is back far enough to clear the belt; place the belt behind the roller and into the belt guide, the edge of the belt to be touching the side of the guide, the projecting ends of the long brass strips to point away from the cartridge plunger and to pass under the steel guide. The pawl lies on the top of the belt. Turn the steel guide plate into position again, and draw the belt through with the left hand until the first pocket is opposite the pocket opener. Fill the hopper with cartridges, and replenish as required. On revolving the crank handle, the pocket opener will enter the first pocket and open it; on continuing the motion, the pocket opener will be withdrawn, and the cartridge plunger will push the lowest cartridge from the column of cartridges into the pocket, the pawl will then feed the belt along, and these motions will be repeated until the belt is filled.

A light pressure should be kept on the belt with the left hand until the weight of the filled portion of the belt is sufficient to assist the pawl. The angle of inclination of the loading tray is an important factor in this, and requires careful adjustment.

N.B.—Great care should be taken to see that the pocket opener enters the pocket each time, otherwise it may pierce and spoil the belt. On this account the crank handle should be held lightly and not turned too fast.

It is advisable to check the crank handle momentarily at the point where the pocket opener is about to enter a pocket

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INSTRUCTIONS FOR CLEANING AND POINTS TO BE OBSERVED WHEN THE GUN IS IN USE.

56. *To clean the Mechanism*, a mixture of equal parts of Russian petroleum and paraffin should be used. If any parts are clogged with dried oil, spirits of turpentine should be used to remove it. After cleaning each part, it should be thoroughly dried and slightly oiled with Russian petroleum. Very little oil should be used for this purpose, as it is apt to catch the dust and clog.

57. The plan of *hanging* the lock and moving the recoiling portion by pulling on the crank handle, affords a ready means of oiling the recoiling portion and the bearing parts of the barrel, viz., (*a*) just in front of the trunnion block (which can be got at by removing the feed block), and (*b*) at the muzzle end, in front of the packing gland.

The lock is hung as follows:—Pull the crank handle slowly backwards till the horns of the extractor drop into

the steps on the rear face of the solid cams. The barrel and side plates can now be moved backwards by placing the thumb behind the knob of the crank handle and the two first fingers on the tail of the handle and rotating it.

58. *To clean the Barrel.*—Open the cover, pull the crank handle over against the roller, raise the lock and let it go forward slowly and rest upon the top of the breech casing. Take off the outer casing and muzzle cup of the ball-firing attachment. Place a piece of flannelette, about 4 inches by 2 inches in each eye or slot of the cleaning rod, care being taken that the latter is surrounded with the flannelette, which should be well oiled; then insert the rod into the muzzle of the barrel, placing the movable bush on the muzzle, and pass it up and down till the barrel is clean; replace the oiled flannelette by dry pieces, and finally pass freshly-oiled pieces through, leaving the barrel well oiled. If the flannelette is tight, and is pushed through the breech, it is necessary to reverse it before pulling it back, otherwise it will jam.

59. When ball ammunition has been fired, daily cleaning of the barrel is necessary for at least ten days afterwards. Subsequent cleaning must depend on the discretion of the officer in charge of the gun; in a dry climate once a week should be sufficient, but in situations where the barrel is exposed to a moist atmosphere it may be necessary daily. The bore should at all times be left coated with oil.

60. When the D.P. barrel has been used for firing blank ammunition it should be thoroughly cleaned as soon as possible and left coated with oil. Subsequent weekly cleaning should suffice, but this also must depend on local conditions

61. *To use the Double Pull-through.*—If slight rust or metallic fouling is present, take off the outer casing and muzzle cup of the ball-firing attachment. Remove the barrel, place the muzzle protector in position, and, having

thoroughly oiled the gauze, drop the weight through the bore from the breech end. Fix the barrel in a vice or have it held firmly by two men and, with the assistance of another man, pull the cord backwards and forwards until the fouling or rust is loosened; the barrel can now be cleaned with the cleaning rod and flannelette as described above. When the gauze fits too loosely to clean the grooves of the barrel, its diameter can be increased by inserting under each side narrow strips of flannelette or paper. When the gauze is worn out, it should be replaced by one of the spare pieces which are issued with each double pull-through.

POINTS TO BE ATTENDED TO BEFORE LEAVING CAMP OR BARRACKS FOR FIRING.

62. (*a*) The surfaces on which all movable parts work should be thoroughly well oiled with petroleum, especially the following:

Bearing parts of the barrel and all recoiling portions.
The lock guides on the side plates, also the working parts of the lock itself, especially the levers and extractor.
Face of the feed block and the edges of the guides inside the feed block.
Bearings of the crank, the extractor stop on the front cover, the curved ramps, lock guides and trigger bar on the inside of the rear cover, and the check lever.

(*b*) In order to see that the recoiling portion works freely, cock the lock, remove the fusee spring box and spring, turn the crank handle upwards, take hold of it with the right hand and the fusee with the left, move the recoiling portion,

with the gun horizontal, backwards and forwards, to see that it works freely and also that the barrel goes close home forward. The weight necessary to move the recoiling portion should not exceed 4 lb.

(*c*) Replace the fusee spring and weigh it with the spring balance as follow : take out the lock, place the loop of the spring balance over the knob of the crank handle, and, standing on the left side of the gun, press down the check lever with the left hand. Pull the balance vertically upwards, resting the wrist on the breech casing ; the reading indicated when the crank handle *commences* to move will be the weight of the fusee spring. This weight should be between 7 and 9 lbs. If the spring is over, or not up to weight, adjust by means of the vice pin ; generally six clicks (three revolutions) make a difference of about 1 lb. Turning the vice pin in the direction of the hands of a watch decreases the weight, and *vice versa*. The tension of the fusee spring should always be kept as high as posible, consistent with maintaining the normal rate of fire of 500 rounds per minute.

(*d*) Examine the barrel by means of the mirror reflector to see that the bore is clear. Examine the lock, feed block, firing lever and safety catch.

(*e*) See that the barrel casing is filled with water. To fill casing, remove the screwed plug at the breech end, and also the cork plug, pour in the water, and replace the plugs. In climates where the temperature is likely to fall much below freezing point not more than about 5 pints of water should be put into the barrel casing, and 20 per cent. of glycerine mixed with the water will prevent it from freezing quickly.

(*f*) Ensure that the handles have been filled with oil ; ascertain that the case, spare parts box, and its contents, and the cleaning rod, are with the gun.

(*g*) Examine the belts, inspect the brass strips, see that the belts are correctly filled and packed carefully in the ammunition belt boxes. Keep the belts dry if possible ; should they get wet, lay them out to dry. New or stiff belts should be well plugged.

(*h*) Should the water in the barrel casing become frozen solid, on the gun being fired the barrel will probably not recoil far enough to work the gun, and will remain back. To remedy this, pull the crank handle on to the roller, then bring it back to a vertical position and force the barrel to the front, pulling the belt if necessary ; let the crank handle return to the check lever and fire the gun. This should be repeated until the barrel recoils correctly.

POINTS TO BE ATTENDED TO DURING FIRING.

63 (*a*) See that a sufficient supply of water is kept in the barrel casing so that the barrel is never uncovered.

The water in the barrel casing begins to boil when the gun has fired about 600 rounds with the greatest rapidity ; after this, if the firing is continued, the amount of water evaporated is about $1\frac{1}{2}$ pints for each 1,000 rounds. When the barrel casing is filled with water about 2,000 rounds may be discharged at short intervals without replenishing, but this depends upon the rapidity with which the gun is fired.

(*b*) The belt is on no account to be pulled when the gun is firing.

(*c*) During a temporary cessation of fire, oil the lock and all frictional parts, remove a partly used belt and replace it by a full one. See that the clamps of tripod legs have not worked loose.

(*d*) Keep the belt always in line with the feed block and the ammunition box, if possible, up to, but not above, the cross head-joint pin.

(*e*) See that belts are refilled without delay.

POINTS TO BE ATTENDED TO AFTER FIRING.

64. (*a*) See that the gun is unloaded.
(*b*) See that the chamber and bore are well oiled *immediately* after firing.
(*c*) See that the lock spring is released.
(*d*) See that any live cartridges that happen to be among the cases are collected.

65. On return to barracks the gun and barrel should be thoroughly cleaned as soon as possible. The water must be drained out of the barrel casing. The lock should be examined to ensure that it is not damaged. The barrel must be removed and carefully dried and oiled, the outside of the barrel being oiled as well as the bore. Ammunition belts should be examined and if wet or damp should be hung up to dry.

STOPPAGES.

66. Stoppages in the automatic action of the gun during firing may be classed under two main headings :—

(i) *Temporary*, which are due to :—

(*a*) Failure of some part of the gun of which a duplicate is carried and which therefore can be easily and quickly replaced, or faulty ammunition.

(*b*) Some cause which can generally be avoided by a high standard of training and a thorough knowledge of their gun by the detachment. These are generally due to neglect on the part of the detachment of some of the points to be observed before, during, and after firing.

(ii) *Prolonged*, which are due to failure of some part of the gun which cannot, as a rule, be put right by the detachment under fire or without skilled assistance. These necessarily put the gun out of action for a more or less prolonged period.

67. On the knowledge and training of the detachment depends the rapidity with which "temporary" stoppages can be overcome.

68. The following table of temporary stoppages, set out under five columns, gives a clear indication of the method to be employed in teaching the detachment the practical side of the mechanism. Column I shows the four positions of the crank handle when the gun stops firing. The first three positions may vary slightly, as shown by the dotted lines. These positions, which afford a ready indication of the cause of stoppage—and therefore of the correct "immediate action" to be performed—must be recognised clearly before the instruction proceeds.

At this stage the detachment should not be required to know what these four positions indicate. The indication given below the diagram will be explained when the probable causes of the stoppages are being taught.

Column II gives a detailed description of the "immediate action" to be performed by the firer (sometimes with the assistance of No. 2) as soon as the position of the crank handle has been recognised after the gun has stopped firing.

Column III deals with the probable causes of these stoppages, but it is of first importance that the instructor does not proceed to this stage until he is assured that every "immediate action" can be correctly and immediately carried out without the slightest hesitation or forethought.

A thorough knowledge of the causes of temporary stoppages will not only give the detachment a practical knowledge of the the working of the gun, but will also be a help in the

discovery of the cause of any unusual breakdown which may occur.

In Column IV is given the method for preventing the recurrence of certain stoppages, the cause of which may be only temporarily cured by the immediate action. It will sometimes be possible to carry out these preventions in two or three minutes; at other times their execution may cause the gun to be temporarily out of action for a longer period; but in either case, no skilled assistance or special appliances other than those carried with the machine gun section will be required.

Column V shows how the various temporary stoppages can be simulated for instructional purposes. It is unnecessary to teach these methods of preparation to the machine gunner, but every instructor must have a thorough knowledge of this column in order to teach the correct "immediate action" for any temporary stoppages.

69. Whenever instruction is being carried out, a belt and dummy cartridges will be *invariably* used, and in order to simulate the various stoppages, empty cases, bulged dummy cartridges, separated cases, and dummy cartridges with the rims thickened, will be required by the instructor.

The instructor must also see that a spare lock, feed block, belt, and a clearing plug, are by the gun, without which the correct immediate action cannot always be carried out.

70. As the clearing of a stoppage often knocks the sights off the aiming mark, the instructor should lay stress on the importance of re-laying the gun, and for this purpose the instructional machine gun or landscape target will be used.

In addition to the instructions conveyed in the table, the following points should be observed:

(i) If, when the cover is opened to investigate the cause of stoppage, it is seen that the extractor is not quite up, no attempt should be made to raise it. On the contrary, it

should be first pushed down before the crank handle is turned over to the roller, as by this means all risk of firing a cartridge accidentally is avoided.

(ii) When a temporary stoppage necessitates the employment of a spare lock, feed block, &c., the part which has been removed should be repaired as soon as possible, so as to make it again available as a reserve.

(iii) Should it ever be necessary to release the lock spring with the lock out of the gun, this should be done with the extractor fully up, and the firing pin hole opposite the firing pin.

Position of Crank Handle and its Indication.	Immediate Action.	Probable Cause.	Prevention of Recurrence.	Method of Preparation for Instructional Purposes.
I.  *Indication.* — The lock is unable to come back far enough to allow the extractor to drop.	(i) Turn the crank handle on to the roller, pull the belt to the left front, and let go the crank handle. (ii) If failure recurs lighten fusee spring by 3 "clicks."	The extractor has not dropped. This may be due to:— (*a*) Too heavy fusee spring. (*b*) Excessive friction, due to want of oil; grit, or tight pockets in the belt, or excessive packing in the cannelure or packing gland. (*c*) Partial loss of the force of the explosion due to:— (i) Worn barrel. (ii) Defective ammunition.	(*b*) Clean and oil working parts. Examine the belt, which should be dried if damp; or if the stoppage is due to a new or stiff belt, the pockets should be plugged. If due to excessive packing, examine, and repack cannelure or packing gland. (*c*) (i) The barrel should be examined at the first opportunity, and, if much worn in the lead, should be changed.	Perform half the loading motions; pull the crank handle slowly back until the horns of the extractor have engaged with the steps on the solid cams; pull the belt to the left front, and let go the crank handle. *For Range Purposes.*—Increase the weight of the fusee spring.
II.  *Indication.* — The lock is unable to go fully home after recoil.	(i) Force the crank handle to the rear; open the rear cover and examine the cartridge on the face of the extractor. If a damaged cartridge, or an undamaged cartridge with the front portion of a separated case adhering to it, clear the face of the extractor and reload. (ii) If an undamaged cartridge, with no front portion of separated case adhering to it is found on the face of the extractor, clear the face of the extractor, replace the lock, keeping the crank handle on the roller.	(i) (*a*) Damaged cartridge. The cartridge is unable to enter the chamber completely although it has commenced to do so. (*b*) Separated case with front portion adhering to undamaged cartridge. (ii) Separated case. The front portion of the case causes an obstruction and prevents the next cartridge from going into the chamber.	(*b*) If a succession of separated cases occur the connecting rod must be lengthened (see para. 86).	(*a*) Bulge the leading dummy cartridge in the belt and load. *For Range Purposes.* — Place a bulged dummy cartridge in the belt. (*b*) Perform half the loading motions. Open the rear cover, withdraw and lift up the lock. Place the front portion of a separated case over the bullet of the cartridge on the extractor. Replace the lock, close the rear cover, pull the belt, and let the crank handle go slowly forward.

II—*continued*.

Position of Crank Handle and its Indication.	Immediate Action.	Probable Cause.	Prevention of Recurrence.	Method of Preparation for Instructional Purposes.
	Take the clearing plug (seeing that the centre pin is back) and insert it into the chamber. Push the pin well home by allowing the lock to go forward. Then, keeping a firm pressure on the crank handle, give the clearing plug a rocking motion; withdraw the lock; lever back the handle of the clearing plug and withdraw it (seeing that the front portion of the separated case is on the clearing plug) and reload.			*For Range Purposes.* — File a cartridge about one inch from the base, and insert in the belt. Care must be taken that the cartridge is not filed too far through, as there is the danger of the bullet being left in the barrel.

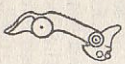
III.  *Indication.* — The extractor is unable to rise to its highest position. If the feed block slide is jammed, there is a fault in feed.	(i) Strike the crank handle on to the check lever by a glancing blow with the palm of the hand.	(i) Excessive friction.	(i) Clean and oil working parts.	(i) Perform the correct loading motions, except that when completing the loading the crank handle must be eased forward gently until it is in the 3rd Position (*see* diagram, col. 1). *For Range Purposes.*—Lighten the fusee spring.
	(ii) If (i) fails, slightly raise the crank handle, pull the belt to the left front, let go the crank handle, and then strike it down on the check lever.	(ii) A cartridge is fed up slightly crosswise or a long brass strip is bent.	(ii) Carefully examine the belt.	(ii) Perform half the loading motions. Pull the crank handle on to the roller. Open the rear cover, pull a cartridge half way into position in the feed block and hold it there, and let the crank handle go slowly forward. Close the cover. *For Range Purposes.*—Bend a long brass strip.
	(iii) A. If (i) and (ii) fail, examine feed block slide; *if jammed*, No. 1 pulls the crank handle on to the	(iii). A. (i). Badly-filled belt with worn or loose pockets. The cartridges.	(iii). A. (i). Carefully examine belt.	(iii), A. (i). Pull out the fourth cartridge in the belt about $\frac{1}{8}$-inch. Perform half the load-

III.—*continued.*

Position of Crank Handle and its Indication.	Immediate Action.	Probable Cause.	Prevention of Recurrence.	Method of Preparation for Instructional Purposes.
	roller, (*), holds it there and unlocks the front cover. No. 2 opens the front cover, and with the assistance of No. 1 raises the feed block sufficiently to allow the recoiling portions to go home. He releases the top and bottom pawls from the belt, which he withdraws until the top cartridge is clear of the feed block and rectifies the belt or cartridges if necessary. He replaces the feed block, pushing the slide over to the left, and lowers the front cover. No. 1 locks the front cover, pulls the belt to the left front, and releases the crank handle.	projecting unevenly from the belt prevent it entering or passing freely through the feed block.		ing motions; pull the crank handle slowly back until the horns of the extractor have engaged with the steps on the solid cams. Draw the recoiling portions to the rear by forcing the knob of the crank handle forward, and tail to the rear, at the same time pulling the belt to the left. Allow the recoiling portions to go forward. Bring the crank handle on to the roller and let go. *For Range Purposes.*—Fill a belt badly.

	(*) *N.B.*—In order to do this, it may sometimes be necessary for No. 2 to open the front cover and force down the horns of the extractor.	(iii). A. (ii). Belt box not being in line with the feed block, the belt does not lead up correctly to the feed block and becomes jammed.	(iii). A. (ii). See that the belt box is in line.	(iii). A. (ii). *For Range Purposes.*—Place the belt box at an angle to the feed block.
		Note.—The effect of a fault in feed is that the top pawls, being engaged behind a cartridge in the belt, are held fast, when some obstruction, such as above, prevents the belt from passing freely through the feed block. The recoiling portions, being connected by the top and bottom levers to the slide, are arrested and prevented from going home. The distance they are held back depends upon the point at which the obstruction asserts itself.		
	(iii). B. If *free*, No. 2 opens the front cover and forces down the horns of the extractor. No. 1 clears the face of the extractor, and changes the lock. He removes the cartridge in position in the feed block and reloads.	(iii). B. (1) Damaged cartridge grooves. (2) Broken gib spring. (3) Broken gib. In these cases, the extractor is prevented from rising to its		(iii). B. Damage the rim of the second dummy cartridge in the belt. Proceed to load. *For Range Purposes.*—Damage the rim of a *dummy* cartridge, and place it in the belt.

III.—*continued.*

Position of Crank Handle and its Indication.	Immediate Action.	Probable Cause.	Prevention of Recurrence.	Method of Preparation for Instructional Purposes.
		highest position. It may be necessary sometimes to slide the cartridge upwards when clearing the face of the extractor. (4) Thick-rimmed cartridge.		*Notes.* — (1) As damage to the extractor has to be simulated by damaging a cartridge rim, this cartridge must be removed before reloading. (2) This stoppage should seldom be practised *on the range*, since the thickened rim may cause damage to the grooves.
		Note.—If it is apparent that the stoppage is due to a thick-rimmed cartridge, it will not be necessary to change the lock.		
IV.  *Indication.* — That there has been no explosion, or, if any, that there has been little or no recoil, the lock remaining in its forward position.	(*a*) Turn the crank handle on to the roller, pull the belt to the left front and let go the crank handle. (*b*) If (*a*) fails, place crank handle on to the roller twice, change the lock and reload.	(*a*) (1) No cartridge in the chamber. (2) Defective ammunition. (*b*) (1) Broken or damaged firing pin. (2) Broken lock spring.		(*a*) Load and press the thumb pieces. *For Range Purposes.* — Place a dummy cartridge in the belt. (*b*) *For Range Purposes.*—The effect of these will be simulated by placing two dummy cartridges in the belt.

Note.—Worn or damaged side or extractor levers may result in the extractor being unable to rise, or, if the side levers are bent, there may be either a succession of separated cases, or the lock may become jammed.

70. The causes of *prolonged* stoppages are so varied that they cannot be set out in detail. The following is, however, of importance, and should be known by all men of the detachment.

Parts of the locks damaged, no spare part being available.—The gun will fire without the sear, or if the bents of the sear or firing pin are badly worn or broken off, but only single shots, and only by pressing and releasing the double button quickly.

The gun will also fire if the nose of the trigger or bent of the tumbler is badly worn or broken off, but only rapid firing. In this case the gun will fire the instant the crank handle reaches the check lever, although the double button has not been pressed.

The gun can be worked as follows :—

(*a*) Group the cartridges in the belt, say 20 or 30 rounds each group.

(*b*) Lay the gun before commencing to load, pull crank handle on to roller, pull belt to left and let handle go ; repeat, but before allowing the handle to reach check lever and the gun to fire, grip the rear crosspiece with left hand to control gun in the ordinary way.

If necessary firing can be stopped by throwing the filled end of the belt over the breech casing to the left. When the firing has been stopped as above described, hold the crank handle with the right hand, open the rear cover, press down the horns of the extractor, draw the lock back, and, if there is a live cartridge on the face of the extractor, remove the feed block and belt, close the cover and allow the lock to fly forward, when the live cartridge, which is on the face of the extractor, will be fired automatically. The lock can then be changed with safety. On no account should the lock be allowed to fly forward until the feed block has been removed and the cover closed. If, on drawing the lock back, it is found that there is no live cartridge on its face, the lock may be changed at once, and the necessity for removing the feed block, and the subsequent precautions, will not arise.

GENERAL INSTRUCTIONS FOR THE MAINTENANCE AND PRESERVATION OF GUNS.

71. The manner in which machine guns are dealt with as equipment in the Land Service is laid down in Equipment Regulations as under :—

Regular Army, Parts 1 and 2.
Special Reserve, Part 1, and Section XVI, Part 2.
Territorial Force, Part 3.

72. For cleaning and oiling guns and mountings in the hands of the troops, the following stores are allowed per annum in peace, for one gun and its mounting :—

Dubbing	½ lb.
Flannelette, Mark III	11 yards.
Linen or cotton, old	3 lbs.
Oil, Mineral, burning	½ pint.
Oil, Petroleum, Russian, lubricating	8 pints.
Turpentine, spirits of	1 pint.
Soap, yellow	4 bars.

73. When guns are returned to store, packed for transmission, or stowed away in any place where they cannot be readily examined, the barrels and unpainted parts should be coated with "Composition, preserving, arms." The mixture is to be made hot, and a piece of flannel dipped in it, with which the exterior parts will be dabbed. To coat the inside of the barrels, draw a bunch of lamp cotton, well saturated

with the mixture, through from both ends. The lamp cotton is to be attached to a piece of twisted copper wire.

74. In frosty weather the working parts of the gun should only be slightly oiled with a lightly-oiled rag.

75. *History sheet.*—A memorandum of examination or history sheet accompanies each gun when issued. It will be carefully preserved and will be handed over with the gun to which it belongs whenever the gun is transferred from the charge of one officer to that of another, particulars being duly recorded. An immediate record will be made in the sheet of any accident which may happen to the gun, and of the result of each official examination it may undergo. On every occasion on which ball ammunition is fired, the number of rounds fired will be shown, the number of the barrel being inserted in the column of remarks.

76. *Barrels.*—A new or part-worn, but serviceable, barrel, is issued as a part of each gun. This barrel is only to be used for firing ball ammunition.

An old barrel, marked D.P., is also issued, to be used only for drill purposes. A second old barrel, marked D.P.B., is issued, to be used only for firing blank ammunition. Its chamber is bushed to take the special blank ammunition. On mobilization these three barrels are to be returned to store. In addition, two new barrels are issued with each gun and are to be kept in store and only taken into use on mobilization, one in the gun and one spare. New barrels in store are distinguished by a band of white paint round the centre.

EXAMINATION, REPAIRS AND ADJUSTMENTS.

Examination.

77. The following are the principal points to be observed in the examination of guns without using gauges :—

Recoiling portion.—See this moves freely. Pull not to exceed 4 lbs.

Foresight.—See that the blade is in good condition.

Tangent sight.—See that the top edge and U on slide are in good condition, and that the slide works correctly.

Safety catch.—See the spring and catch act automatically when the firing lever is released.

Firing lever.—Test the firing lever by seeing that the trigger bar does not release the trigger before the safety catch is clear, and also see that the trigger is released before the stop on the lever bears against the stop on the rear crosspiece.

Connecting rod.—Test whether correct length with both locks as follows : Take off the fusee spring. Raise the cover, turn the crank handle back and remove the lock. Place one of each of Nos. 1 and 2 washers on the outer face of the adjusting nut on connecting rod. Replace the lock on the connecting rod and let it down into the gun, retaining the lock in its rear position. The extractor being down, insert, through the opening in the underside of the breech casing, the *special armourers machine gun dummy cartridge in the bottom end of the extractor over the firing pin hole. Push the extractor right up to the upper stop, and, still retaining hold of

* In the absence of this a "gauge, distance of bolt-head from chamber, ·064-inch," may be used.

the cartridge, see that the barrel is home; then turn the crank handle over towards the check lever, at the same time guiding the cartridge into the chamber. Push the check lever back just clear of the crank handle and let the crank handle gently down towards rest. If the connecting rod is within limit for strength, a check will be felt. If no pressure is required, it shows that the lock is not fully home (*i.e.*, the connecting rod is not long enough, and therefore outside the limit). If within limit, remove the washers. If outside the limit, washers must be fitted permanently to the connecting rod (*see* para. 86).

No. 1 washer is plain. No. 2 washers of later manufacture have two small holes punched in the rim.

Barrel.—See to the condition of bore, rifling, lead and exterior.

Lock.—Test the extractor and side levers by bringing the crank handle gently on to the check lever. If the levers are correct, the extractor will be right up. Test the bents of the sear and firing pin. To do this, pull the crank handle on to the roller, then bring the crank handle gently down on to the check lever. The extractor should be well up to the top position before the sear is released. Examine the face of the extractor for burrs and flaws, at the gib gap and firing pin hole. Try the grooves with a dummy cartridge (armourers' dummies must be used for this purpose) to see the gib holds the cartridge horizontally. See that the nose of the trigger and bent of the tumbler are not too much worn. See that the point and bent of the firing pin are in good condition. A broken firing pin can be recognized without stripping the lock by releasing the lock spring with the extractor up. If correct, the firing pin will then protrude from the firing pin hole and can

be withdrawn by raising the tail of the tumbler. If it does not protrude, or, if protruding, the point is not withdrawn when the tail of the tumbler is raised, the firing pin is broken.

General.—See that all axis pins are correct.

Repairs and Adjustments.

78. *Stripping the gun.*—The gun is stripped in the following order, the gun being on the mounting.

Note:—Operations marked with an asterisk will *only be performed by an armourer.*

Lock.—Clear the extractor by revolving the crank handle twice; raise the rear cover, pull the crank handle on to the roller; see that the extractor drops, place the finger between the extractor and stop and lift the lock—at the same time allowing the crank handle to move slowly forward until the lock is released from the side plates. Give the lock $\frac{1}{6}$ turn and lift it out.

Block, feed.—Raise the front cover and lift out.

Box, fusee spring.—With the right hand at the rear and the left hand at the front, press the box forward until clear of the lugs and remove. Disconnect the fusee chain and remove the box and the spring.

Fusee.—Turn the fusee to the rear until the lugs on the stem are free to be withdrawn.

Ball-firing attachment.—Withdraw the split pin. Give the outer casing $\frac{1}{6}$ turn and remove it. Unscrew the front cone. Loosen the clamping screw of the muzzle cup and revolve the cup till the clamping screw coincides with the flat on the barrel. Remove the muzzle cup. Unscrew and remove the gland and packing.

Recoiling portion.—Raise the rear cover, unscrew the

rear crosspiece T-fixing pin, and hinge down the rear crosspiece; remove right and left slides, and draw out the recoiling portion. Disconnect the side plates from the barrel (removing the left one first).

* If necessary, by taking out the fixing pin, the crank handle can be driven off with a drift and hammer, but as a rule this should not be stripped.

Roller.—Remove split fixing pin, collar and roller.

* *Lever, check.*—Drive out the keeper pin from the underside, and take off the check lever. To remove the piston and spring, turn the piston—by using a screwdriver in the slot—until its lugs are free to pass along the slots, when the piston will be forced out by the pressure of the spring.

* *Sight, tangent.*—Unscrew the axis pin and force it out. Remove tangent sight, piston and spring.

Lock, cover, rear.—Unscrew the axis pin and force it out. Remove the cover lock and spring.

Trigger bar.—Remove the spring and withdraw the trigger bar.

* *Covers, front and rear.*—Remove the keeper pin and check nut, and force out the joint pin.

* *Catch, cover, front.*—To remove the spring and plunger, force the plug forward and give $\frac{1}{4}$ turn by means of a screwdriver, when the plug will be forced out by the spring. Before removing the plunger it must be turned so that the slots are free to pass the lugs in the catch. If necessary, by taking out the keeper pin the catch can be taken out, but as a rule it should not be removed.

* *Rear crosspiece.*—Remove the keeper pin and check nut, and force out the joint pin.

* *Sight, fore.*—The position of the foresight should first be carefully marked; drive the foresight out of the dovetail seating through the right-hand opening in the protector.

Take out elevating and crosshead joint pin and remove the gun from the mounting.

Steam tube.—Up-end the gun so that it stands on the rear end of the breech casing.

Remove the keeper screw and unscrew the steam tube, using the special tool provided for the purpose. (This should not be removed if the valve is free.)

* *Shutter, sliding.*—Press in the catch and force the shutter to the front until it is against the stop, then press in the plunger with the No. 3 punch and further force the shutter forward until it is clear of the breech casing.

79. *Assembling the gun.*—Reverse all the foregoing operations with the exception that the recoiling portion must be replaced before the front packing and gland.

Care must be taken when re-assembling the steam tube that the acorn end is inserted into its seating in the barrel casing.

This is more easily assured by keeping the acorn end in contact with the adjacent channel formed by corrugation of the barrel casing.

The tube should screw home freely when in the correct position.

Stripping various Components.

80. *To strip the lock.*—See that the lock is cocked; force out the side lever split pin and axis bush; remove side levers, extractor levers and extractor. Release the lock spring and push out the trigger and tumbler axis pins; remove trigger, tumbler, lock spring, firing pin and sear with spring.

To strip the extractor : Push out the gib spring cover and remove spring and gib.

To assemble the lock : Reverse the above, except in the case of the lock spring, which must be forced home, long arm towards the extractor, when the lock is in the fired position, and when all the other parts are assembled.

NOTE.—The firing pin should never be released unless the extractor is up to the top stop.

81. *To strip the feed block.*—Force out the split pin and separate the top and bottom levers, take out the slide and remove pawls and spring.

Draw out the bottom pawl axis pin and remove spring and pawls.

To assemble, reverse the above.

* 82. *To strip the rear crosspiece.*—Unscrew the firing lever axis pin and remove the firing lever. Unscrew the safety catch axis pin ; remove the safety catch and spring with piston ; lift out the trigger bar lever.

To assemble, reverse the above. (See that the pawl engages the trigger bar lever.)

* 83. *To strip the tangent sight.*—Remove the fixing screws, graduated plate, milled head and slide spring ; drive out the pawl fixing pin ; take off the pawl ; push out the pinion and remove the slide.

To assemble, reverse the above.

84. *To renew the packing at the breech and of the barrel.*—Should the gun leak at the breech, empty the barrel casing. Draw out the recoiling portion as directed above. Wind a strand of asbestos (part of a 5 yards piece) in the cannelure of the barrel, pressing it together with a thin piece of wood or the point of a screwdriver or knife, until the cannelure is full, then oil the asbestos and re-assemble the parts.

85. *To renew the packing at the muzzle end of the barrel.*—Should the gun leak at the muzzle, stand the gun on the rear

crosspiece, remove the ball-firing attachment, unscrew the gland and repack, or, if necessary, replace the asbestos, having first oiled it, by winding it loosely round the barrel, and whilst winding, push it in with punch No. 2, a piece of wood, or any blunt ended instrument which will fit ; screw on the gland, as tightly as can be done by hand, return the gun to a horizontal position, hang the lock, and work the recoiling portion backwards and forwards to ensure that it moves freely. If the packing is found to press too hard on the barrel, the gland should be removed and one or two strands taken out of the asbestos.

86. *Instructions for fitting washers to connecting rod when required.*—Take off the fusee spring. Raise the cover, turn the crank handle back and remove the lock. Turn the connecting rod back on to the trigger bar lever, then with the combination tool unscrew and remove the adjusting nut from the connecting rod. Place one of each of Nos. 1 and 2 washers on the shoulder of the connecting rod and screw the adjusting nut tightly home on to the washers.

Place one more of each of Nos. 1 and 2 washers on the outer face of the adjusting nut and test the length of the connecting rod.

87. *Instructions for fitting spare discs for the ball-firing attachment.*—Unscrew the front cone. Cut the front bevel of the disc across with a chisel, driving sufficient metal up to provide a hold for the pliers. Remove the disc and replace it with a new one. When assembling a new disc it may be necessary to tap the front cone lightly while screwing the disc home.

88. *Instructions for the use of the tool for repairing belts.*—Remove the damaged strips and eyelets. If a long strip requires fitting, first join the two portions as follows :—Place an eyelet in the hole of the dished end. Insert the punch of the tool into the unopened end of the eyelet, the opened end to

rest upon the die, and gently press the handles together. Then put the punch in the other end of the eyelet and press the handles ; then, keeping the belt horizontal, move the handles of the tool backwards and forwards in a circular direction with the punch of the tool as the centre, so as to shape the head of the eyelet nicely.

Put the strips into position on the belt, insert the eyelets, and repeat the above operation.

Short strips are fitted in a similar manner except that they do not require joining at one end previous to placing them upon the belt.

Care must be taken to press the eyelets as far through the strips as possible before using the tool in order to form a good head.

SPARE PARTS AND IMPLEMENTS.

A filled spare part box, containing the following, is issued with each gun :—

	Carried in *Box.*	*Case.*
Balance, spring	—	1 (*a*)
Block, feed	—	1
Boxes, tin, for small parts	2	—
Bushes, axis side levers	1	1 (*a*)
Case, spare part box...	1	—
Collar, roller	1	—

(*a*) In wallet.

	Carried in *Box.*	*Case.*
Corks	1	1 (*a*)
Cup, muzzle attachment	1	—
Discs, muzzle attachment	5	1 (*a*)
Eyelets, long	ozs. ½	—
Funnel	—	1
Fusees with chains	1	1 (*a*)
Gibs	1	1 (*a*)
Hammer	1	—
Lever, extractor, left	1	—
„ „ right	1	—
Lock	—	1
Packing, asbestos, 5 yds. (pieces)	2	—
Pins, axis, trigger	1	1 (*a*)
Pins, axis, tumbler	1	1 (*a*)
Pins, firing	1	1 (*a*)
Pins, fixing, crank handle	2	—
Pins, split, fixing collar roller	2	—
Pins, split, keeper, bush axis, side levers	1	1 (*a*)
„ „ „ check nuts, long ...	4	—
Pin-T, fixing rear-crosspiece	—	1 (*a*)
Piston, check lever	2	—
Pliers, cutting (pair)...	—	1 (*a*)
Plug, belt	1	—
Plug, clearing	—	1 (*a*)
„ cork	1	—
Plugs, front cover catch	2	—
Plug, screwed	1	—
Plunger, front, cover catch...	2	—

(*a*) In wallet.

	Carried in Box.	Carried in Case.
Protector, muzzle	—	1 (a)
Pullthrough, double	—	1 (a)
Punch, No. 3	—	1 (a)
„ No. 5	—	1 (a)
Reflector, mirror	—	1 (a)
Roller	1	—
Screw, clamping, cup, muzzle, attachment	1	—
Screwdriver, large	1	—
„ small	—	1 (a)
Sear, with spring	—	1 (a)
Sight, fore	1	—
Sight, tangent	1	—
Spanner, shifting	1	—
Spring, bottom pawl	1	—
„ check lever	2	—
„ cover lock	2	—
„ front cover catch	2	—
„ fusee with fittings	1	—
„ gib	1	1 (a)
„ lock	3	1 (a)
„ safety catch with piston	2	—
„ sear	2	—
„ sliding shutter catch	2	—
„ tangent sight	2	—
„ „ „ slide	2	—
„ top pawl	1	—
„ trigger bar	2	—
Strips, long	25	—
„ short	25	—

(a) In wallet.

	Carried in Box.	Carried in Case.
Tool combination	—	1 (a)
„ repairing belt	1	—
Trigger	—	1 (a)
Tumbler	—	1 (a)
Wallet, case, spare parts box	—	1
Washers, adjusting, No. 1—·003-inch	—	3 (a)
„ „ No. 2—·005-inch	—	3 (a)
Wire gauze, pieces	—	2 (a)

In addition, the following are supplied to complete the equipment :—

Barrels	*See* paragraph 76
Belts, ammunition	*See* Equipment Regulations.
Lock, skeleton, brass	
Lock D.P. (instructional)	
Rod, cleaning	

Box, Spare Parts and Tools, ·303-inch Vickers Gun (Mark I).

The box is of leather of the following dimensions :— 13 inches by $8\frac{1}{4}$ inches by $5\frac{1}{2}$ inches (approximately). Internally it is fitted with partitions, loops, and straps, to take the stores enumerated on pp. 50–53. It is closed with a lid which is secured by a strap. Carrying straps, with handle, are provided. The box also carries the spare part case.

(a) In wallet.

*Case, Spare Part Box, ·303-inch Vickers Gun (Mark I).

The case is of leather, 8½ inches by 5 inches by 4 inches. It contains the wallet, and stores enumerated on pp. 50–53. It is closed by a lid secured by a strap. A lifting strap 66 inches long passes round the case through loops at the sides.

*Wallet, Case Spare Parts Box, ·303-inch Vickers Gun (Mark I).

The wallet is of leather, and when opened out measures 11½ inches by 8¼ inches. It is provided with a double pocket to take the stores enumerated on pp. 50–53. When folded it is secured by a strap. The wallet is carried in the spare part case.

·303-inch Vickers Gun.

Explanation of Plates I to VIII.

Similar numbers indicate corresponding parts in all the plates.

1. Casing, barrel.
2. Tube, steam.
3. Bracket, foresight.
4. Gland.
5. Casing, breech.
6. Cover, front.
7. Cover, rear.
8. Sight, tangent.
9. Bar, trigger.
10. Lock, rear cover.

* The case with wallet forms a first aid gun kit and should always accompany the gun when in action, the box being left in the wagon line.

11. Rear-crosspiece.
12. Lever, firing.
13. Lever, trigger bar.
14. Catch, safety.
15. } Plugs, screwed.
16. }
17. Protector, screwed, condenser boss.
18. Plug, cork.
19. Guide, front, barrel bearing.
20. Crosshead.
21. Cams, right and left.
22. Steps of cams, right and left.
23. Catch, front cover.
24. Pin, screwed, joint cover.
25. Pin-T, fixing, rear-crosspiece.
26. Pin, screwed, fixing, crank handle.
27. Slides, right and left.
28. Roller.
29. Pin, screwed, joint, rear-crosspiece.
30. Bracket, check lever.
31. Lever, check.
32. Bracket, elevating joint.
33. Stop, mounting.
34. Plate, bottom, breech casing.
35. Shutter, sliding.
36. Hooks of front cover catch.
37. Hole for keeper pin, front cover catch.
38. Lever of catch, front cover.
39. Grooves in front cover catch to clear "36."
40. Plunger, front cover catch.
41. Bridge, rear cover.
42. { Spring tangent sight. { Piston „ „
43. Grooves in rear cover for ribs on "5."
44. Ramps, rear cover.
45. Spring, rear cover lock.
46. Spring, trigger bar.
47. Lug on trigger bar for "46."
48. Base of tangent sight stem.
49. Hooks of rear cover lock.
50. Lug on rear cover lock for "45."
51. Slot in trigger bar for "86."
52. Lug on trigger bar for "13."
53. } Thumb-piece, sliding
54. } shutter catch.
55. Plunger, sliding shutter catch.

56. Arms of rear-cross-piece.
57. Grips, rear-crosspiece.
58. Pawl, firing lever.
59. Spring, safety catch, with piston.
60. Pin, screwed, axis, safety catch.
60a. Finger grips, safety catch.
61. Pin, screwed, axis, firing lever.
62. } Thumbpiece, firing
63. } lever.
64. Pin, keeper, check lever.
65. { Piston, check lever.
{ Spring, " "
66. Recess in check lever for "65."
67. Barrel.
68. Casing, lock.
69. Plate, side, right.
70. Crank.
71. Handle, crank.
71a. Tail of crank handle.
71b. Knob of crank handle.
72. Rod, connecting.
72a. Stem of connecting rod.
73. Fusee.
73a. Chain, fusee.
74. Spring, fusee
74a. Hook, fusee spring.
75. Box, fusee spring.
75a. Screw, adjusting, fusee spring.
76. Block, feed.
77. Cannelure in "67" for asbestos packing.
78. Trunnion block, barrel.
79. Lock.
80. Levers, side (pair).
81. Socket of side levers for "72a."
82. Extractor.
83. Gib.
84. Spring, gib.
85. Cover, gib spring.
86. Trigger.
87. Lever, extractor, right.
88. Tumbler.
89. Spring, lock.
90. Pin, firing.
91. Sear.
92. Spring, sear.
93. Flanges of lock casing.
94. Interruptions in flanges of lock casing.
95. Slots in lock casing for "99."
96. Bearings on lock casing for "80."
97. Upper extractor stop of lock casing.

98. Bent of extractor lever for "80."
99. Lugs on side levers for "95."
100. Bush, axis, side levers.
101. Pin, split, keeper, bush, axis, side levers.
102. Horns of extractor.
102a. Grooves in extractor for "79."
103 Shoulders of extractor for "87."
104. Grooves in extractor for side plate springs.
105. Hole in extractor for "90."
106. Recess in extractor for "83."
107. Pin, axis, trigger.
108. Pin, axis, tumbler.
109. Key of pin, axis, tumbler.
110. Projection on firing pin for "89."
111. Lever, top, feed block.
112. Lever, bottom, feed block.
113. Pins, split, fixing, top and bottom levers, feed block.
114. Stud of top lever for feed block slide.
114a. Slide, feed block.
115. Pawl, top, feed block, rear.
115a. Thumb grips of "115" and "116."
116. Pawl, top, feed block, front.
117. Spring, top pawls, feed block.
118. Pawls, bottom, feed block (pair).
119. Pin, axis, bottom pawl, feed block.
120. Finger plate of bottom pawls, feed block.
121. Spring, bottom pawls, feed block.
122. Cup, muzzle attachment.
123. Casing, outer, muzzle attachment.
124. Cone, front, muzzle attachment.
125. Gland, muzzle attachment.
126. Screw, clamping, cup, muzzle attachment.
127. Disc, muzzle attachment.
128. Vent, bullet, muzzle attachment.

PART II.

MOUNTING, TRIPOD, ·303-INCH MAXIM GUN, MARK IV.

(Plates X and XI.)

The mounting consists principally of a crosshead (*a*), elevating gear (*b*), and socket (*c*), mounted on three legs.

It is constructed to give 13 degrees elevation and 25 degrees depression at heights varying from 14½ inches† to 30 inches from the axis of the gun to the ground. By arranging the position of the rear and front legs respectively, elevation may be given up to about 43 degrees and depression to 55 degrees. An all round traverse can be obtained.

The crosshead (*a*), to which the gun is pivoted, is formed with a pivot to fit into the socket (*c*) and an arm (*d*) which carries the elevating gear (*b*).

The elevating gear, which is actuated by a handwheel (*v*), consists of an inner and outer screw (right and left-handed) and a nut working within a tumbler (*g*). The tumbler is split and provided with a jamming bolt (*h*), by which the wear may be taken up. A chain secures the inner screw to the crosshead to prevent loss while travelling.

The socket (*c*) is bored to receive the crosshead and is provided with three lugs (*n*), to which the legs are hinged; a jamming block and screw with handle (*f*) is attached to the front to secure the crosshead in any desired angle of

† *See* Plate XI.

traverse; the block works in a recess in the upper portion of the crosshead and prevents it from rising. Both faces of the rear lug and one face of each front lug are fitted with clutch plates having radial serrations to correspond with similar serrations on the faces of the leg joints. Joint studs with disc spring and jamming handle (*s*) are fixed to the front lugs, by which the legs are securely clamped to the socket in the required position.

The legs (*j*, *k*) are of tubular steel, the lower ends being fitted with shoes (*m*) to steady the mounting on the ground, and the upper ends having a joint with radial serrations mentioned above. Tho rear leg is provided with a joint pin with nut and jamming handle (*t*).

On a portion of the periphery of the leg joints numbers are stamped at regular intervals so that when read in conjunction with a zero mark the relative position of the legs to their normal position may be readily seen.

A strap is fixed to the rear leg to secure the three legs during transport.

When firing, the ammunition box is placed on the ground on the right side of the gun.

Weight of mounting ... ... 48 lbs.

The Vickers gun can be fired from service mountings.

BAR, CARRYING MAXIM GUN ON TRIPOD, MARK I.

The bar is of bamboo, with a leather strap, 1 inch by 22 inches, attached by copper wire at the middle. It is for moving guns on tripods short distances without dismounting the gun.

In use, the bar is placed under the rear end of the barrel casing, and secured by the strap. The gun and mounting can then be removed by three men—one at each end of the bar, and one to hold either the rear leg of tripod or cross piece of gun.

Length	... 3 ft. 6 ins.
Weight (about) ...	... 2 lbs.

HOODS, PROTECTING :—

MARKS II AND IV TRIPOD GUN MOUNTS.

The hoods are made of leather, lined with brown felt, and are for use in protecting the gun mount when tripods are carried in G.S. limbered wagons.

MOUNTINGS, TRIPOD, ·303-INCH MAXIM GUN, MARK IV.

LIST OF COMPONENT PARTS, ETC.

Designation.	Details.	Number.
Components.		
Bolt, jamming elevating gear ...	steel	1
Bush, handwheel, elevating ...	M.B., with nut and steel feather ...	1
Chain elevating screw, Mark IV,		
Tripod mounting	steel	1
Crosshead	M.B. (also pivot) with keep pin ...	1
Handles, jamming, front leg ...	steel	2
Legs { front, left ...	steel, tubular; with shoe and serrated joint	1
Legs { front, right ...	steel, tubular; with shoe and serrated joint	1
Legs { rear	steel, tubular; with shoe and forked serrated joint	1
Nuts { elevating ...	steel	1
Nuts { jamming rear leg ...	steel, with handle	1
Nuts { screw, jamming pivot ...	M.B.	1
Pins, joint { elevating gear ...	steel, with steel securing cord with ring and keep pin	1
Pins, joint { crosshead... ...	steel, with steel securing cord with loop	1

MOUNTINGS, TRIPOD, ·303-INCH MAXIM GUN, MARK IV—*continued.*

DESIGNATION.	DETAILS.	NUMBER.
	COMPONENTS—*continued.*	
Pins { joint, rear leg	steel	1
{ tumbler	steel	2
Plates, inscription	G.M., with screws	1
Screws { elevating, No. 22	steel in 2 parts (inner and outer) ...	1
{ clamp checking traverse ...	steel, with handle, M.B. nut and jamming block	1
Socket	M.B., with steel clutch plates (for pivot of crosshead)	1
Straps, securing 1-inch × 86-inches ...	leather (for housing legs)	1
Studs, joint, front legs... ...	steel, with nut and keep pin ...	2
Tumbler, elevating gear	M.B., with nut	1
Wheel, hand elevating...	M.B.	1
	STORES ISSUED AS PART OF MOUNTING.	
Holder, joint pins	leather, with attachment straps ...	1

CASE :—
·303-INCH VICKERS GUN, MARK II.

The case is used to convey the gun in the G.S. limbered wagon on the line of march ; it is made of leather with a lid secured by three quick release straps, and is fitted to hold the stores detailed below :—

To contain :—

Gun ...	...	1
Gun barrel ...	...	1
Rod, cleaning	...	1
Weight ...	...	28 lbs. (approximately).

The case differs from the previous mark in being made longer in order to take the blank, or ball, muzzle attachments, the wood chocks are differently arranged to prevent injury to the gun and the position of the cleaning rod is arranged so that the handle is on the right-hand side.

The Mark I case when modified so that the gun with muzzle attachment can be carried, will be designated Mark I*.

CASE, SPARE GUN BARREL AND CLEANING ROD.
·303-INCH M.G., MARK II.

The case is a leather tube 34·5 inches long by 1·6 inch diameter (internal measurements) pointed at one end, and fitted with a leather cap and strap at the other. The case is also provided with two straps with buckles for securing it to the tripod hanger of ·303-inch M.G., packsaddlery.

WAGON, LIMBERED, G.S. { FORE, MARK I. / HIND, MARK II.

The wagon consists of fore and hind portions, connected by a perch, mounted on wheels, 2nd class C, No. 198 A. A certain number of wagons nave been issued with 2nd class C, No. 43, and some with No. 198 wheels.

The fore portion consists of a framework, fitted with side and front boards and a hinged tail board, a limber hook, No. 27, a 2nd class C axletree, No. 141, and the following draught fittings :—

Pole, draught, No. 17, Mark III.
Bar supporting draught pole, No. 3, Mark II.
Swingletrees, No. 13, Mark I.

The inside is divided transversely by a removable partition, and a locker—fitted to carry spare parts, &c., as shown in the table below—is attached outside the near side board. Two clips for the carriage of a rifle in canvas case are fitted to the front board and two on the off side board.

The hind portion is generally similar to the fore, but it has no locker, or clips for rifles, is fitted with a removable perch (in place of fittings for draught), a folding seat at the back and a brake which is applied from the rear and acts on the front of the wheels.

Both portions are provided with a canvas cover.

The wagon is fitted to carry the following spare and wagon equipment stores.

Stores.	Fore.	Hind.	Where carried.
Grease, lubricating (in grease box) lb.	3	3	Off side.
Spanner, No. 184†	...	1	
Blocks, brake, field and transport (spare)	2	...	Locker, near side.
Board, inventory, wood	1	...	
Collar, adjusting, 2nd class C, capped wheels... ... ... (spare)	1	...	
Screwdriver, G.S., 6-inch	1	...	
Hammer, claw, 16 or 14-oz.	1	...	
Pincers, carpenters' ... ... pair	1	...	
Pins, linch, 2nd class C, capped wheels (spare)	1	...	
Spanner, adjustable 11-inch	1	...	
Washer, drag, 2nd class C, capped wheels (spare)	1	...	
Brush, water carriage...	1	...	Near side.
Buckets, water, G.S. leather	2	...	Under.
Cordage, spun yarn, hemp, tarred, 3 thread lb.	5	...	Near side.
Ropes, drag, light, G.S. ... ... pair	1	...	Off side.
Valise, horse shoes ... ... (1)	...	...	As convenient.

† Component of wagon.—Wagons provided with No. 43 wheels carry a No. 93 spanner.

The following are the dimensions, weights, &c. :—

Fore and hind portions limbered up.—	ft.	ins.
Length over all—with pole	22	10
without pole	13	9
Height	4	8
Width	6	4
Track	5	2
Distance between axletrees	7	$10\frac{1}{2}$
Diameter of turning circle	25	$8\frac{1}{2}$

Angle of lock	85·75 degrees.
Floor space, each portion ...	4ft. by 3ft. 4ins.

	ft.	ins.
Fore portion—		
Length—with pole	13	11
without pole	4	10
Hind portion—		
Length—with perch	9	1
without perch	5	4
Wheel, 2nd class C, No. 198 A., Mark I.—		
Diameter	4	8
Width of tire	0	2½

Weights without cover and spare parts—	cwts.	qrs.	lbs.
Fore portion	5	2	0
Hind portion	5	0	3

Tonnage for shipment—	Tons.
Fore and hind portions without wheels, pole and perch	4·201
Wheels, No. 198 A. (4)	1·458
Pole	·032
Perch	·017
Boat transport—	
Dimensions—13ft. 5in. by 6ft. 4in. by 4ft. 8in.	
Tonnage	9·913

Covers.

The covers, both "Fore" and "Hind," are of waterproof canvas, 77½ inches by 69½ inches; they are secured to the wagon by 2 lines on each side and straps at the corners.

Weight, each ... 9lb. 11ozs.

Wheel, 2nd Class "C," No. 198A.

The wheel is 4ft. 8ins. in diameter, has a manganese bronze nave with a removable pipe box and a 2½-inch steel tire. The nave consists of two flanges which are connected by 12 bolts; the pipe box passes through the flanges and is secured by a small bolt; a dust cap is screwed to the outer flange. The outer end of each spoke fits into a steel socket secured to the felloe.

Weight ... 1cwt. 14lb.

The Nos. 198 and 206 wheels are generally similar to the above. The No. 200 wheel has plain steel flanges and no dust cap. The No. 43 wheel differs principally from the above in being of double spoke construction and has a 3-inch tyre.

Any of these wheels may be used with the wagon, limbered, G.S.

STORES CARRIED IN G.S. LIMBERED WAGONS FOR CAVALRY MACHINE GUN SECTION.

(*See* Plates XII—XIV.)

Articles.	No.	Approximate weight. lb.	Approximate weight. ozs.	Where carried.
Fore Portion.				
Bar, carrying Maxim gun on tripod... ...	1	1	10	Along top of ammunition belt boxes.
Bags, sand, common	15	8	14	
Belts, ammunition, Maxim ·303-inch, 250 rounds — in belt boxes (filled) ...	14	271	0	As shown.
Belts, ammunition, Maxim ·303-inch, 250 rounds — spare (empty)	2	4	2	As shown.
Box, dubbing, 1 lb. (filled)	1	1	8	
Box, spare parts and implements, Vickers, ·303-inch (filled) (*a*)	1	20	0	As shown.
Cans (filled) — lubricating, No. 9 (*b*) ...	2	1	10	In case as shown.
Cans (filled) — half-pint (*c*)	2	0	14	In case as shown.
Cases, can, ·303-inch tripod mountings ...	1	2	3	As shown.
Condensers, steam	1	2	4	
Flannelette ... ... yds.	3	0	2	Rolled in "Linen old" as shown.
Guns — Maxim and Vickers, protectors, muzzle	1	0	3	In case with gun.
Guns — Vickers ·303-inch, in leather case, with cleaning rod and spare gun barrel ...	1	70	—	As shown (casing filled with [water).
Guns — Vickers plugs, cork complete ...	1	0	1	In case with gun.
Linen, old ... ... lb.	½	0	8	See above.
Mallets, heel peg	1	2	8	
Mounting, tripod, ·303-inch Maxim gun, Mark IV, complete, with hoods, protecting	1	59	0	In leather case as shown.
Muzzle attachment for ball firing	1	1	7	In case with gun.
Pins, joint, crosshead	1	0	10	With Mounting as above.
Pins, joint, spare elevating gear	1	0	5	With Mounting as above.
Plugs, belt, Maxim, ·303-inch ... ... set	1	0	4	In case with gun.
Reflectors, mirror, machine gun, 303-inch	1	0	1	Rolled in "Linen old" as above.
Rifles of drivers	2	17	5	
Hind Portion.				
Axes, head, 4½ lbs.	1	4	8	In bottom of rear of wagon loose.
Axes, pick helves, 36-inch, ferruled	1	3	4	In bottom of rear of wagon loose.
Blankets, saddle (*d*)	2	10	8	Rolled with saddle luggage.
†Cartridges, small arm, ball, 303-inch cordite ... ... boxes (*e*)	4	299	0	In 4 boxes in front bed of wagon.
Hook, bill	1	2	0	Loose under harness.
Luggage, saddle, with appurtenances, &c., shown in Cavalry F.S. Manual	1	43	4	Rolled in blanket under pack saddlery.
Machine, belt-filling, in chest (*f*)	1	42	0	Right front under pack-saddlery.

(*a*) 10 yards of spare cord for mekometers are carried in addition to the usual stores, in this box (in one of the 2 wagons).

(*b*) For mineral oil 1
For lubricating G.S. oil 1 } Per gun, packed in one case, can, ·303-inch.

(*c*) For lubricating G.S. oil 1
For turpentine 1 } Per gun, packed in one case, can, ·303-inch.

Method of carrying. Remove dividing board and place diagonally across rear part of rear portion of wagon. Place gun in centre of fore portion, from front to rear. Eleven belt boxes on one side (end on to gun case), with tripod in hood (legs flat on floor) and spare part box as a wedge between it and the gun case on the other side, prevent all lateral motion without detriment to speed in handling the gun. Remainder of boxes (3) at end of tripod legs. Heavier end of gun and tripod to rear of wagon.

(*d*) For off horses. (*e*) Fore part.

(*f*) Only carried by one of the two wagons. The box is carried loose in the rear portion, and is clamped to the perch for use.

STORES CARRIED IN G.S. LIMBERED WAGONS FOR CAVALRY.—*contd.*

Articles.	No.	Approximate weight. lb.	Approximate weight. ozs.	Where carried.
HIND PORTION—*contd.*				
Packsaddlery, machine gun, ·303-inch (*g*) *sets	1	214	0	Stripped as shown.
Shovel, G. S.	1	3	8	With pick in bottom of wagon (rear part).
Surcingle, leather (*h*)	1	0	15	Strapped round luggage saddle.
Valise, horseshoe, with 3 sets of shoes (and nails)	1	20	0	In bottom of waggon.
Load...		1,110	6	
G.S. limbered wagon equipped with spare parts and wagon equipment stores ...		1,280	5	
Total loaded G.S. limbered wagon ...		2,390	11	= 22 cwt. (about).

(*g*) Gun packsaddle in fore part, 2 ammunition pack saddles in rear part. *See* footnote.
(*h*) For the off lead horse.
* A set of machine gun packsaddlery consists of 1 gun packsaddle and 2 ammunition packsaddles. Each ammunition packsaddle has two racks, and each rack will accommodate three belt boxes.
The M.G. packsaddlery is normally carried in the limbered wagons. When required for use it will be carried by such of the draught horses of the vehicle, allotted to the machine gun section as may be found most convenient.
† One of the two wagons will carry an extra box of S.A.A.

STORES CARRIED IN G.S. LIMBERED WAGON FOR INFANTRY MACHINE GUN SECTION.

(*See* Plates XV–XVII.)

Articles.	No.	Approximate weight. lbs.	Approximate weight. ozs.	Where carried.
FORE PORTION.				
Axes, pick { head	1	4	8	Across rear of wagon on top of belt boxes.
Axes, pick { helve, 36-inch, ferruled ...	1	3	4	Across rear of wagon on top of belt boxes.
Bags, sand, common	15	8	14	Off hind portion in bundle as shown.
Bar, carrying Maxim gun on tripod... ...	1	1	10	On top of gun case.
Belts, ammunition, Maxim, ·303-inch (in boxes) (*a*)	14	271	0	As shown.
Box, spare parts and implements, Vickers (filled) (*b*)	1	20	0	Off fore portion under belt boxes.
Cans { lubricating, No. 9 (*c*)	2	1	10	Off hind corner.
Cans { half-pint (*d*)	2	—	14	Off hind corner.
Cases, cans, ·303-inch, tripod mountings ...	1	2	3	
Clinometer, field (in case)	1	2	8	Under sand bags, off hind corner.
Condenser, steam	1	2	4	

(*a*) Each belt contains 250 rounds, S.A.A.
(*b*) Contains in addition to usual stores, 20 yards of spare cord for mekometers.
(*c*) One for mineral oil, one for oil, lubricating, G.S., packed in the case, can, ·303-inch.
(*d*) One for oil, lubricating, G.S. ; one for turpentine, packed in the case, can, ·303-inch.

STORES CARRIED IN G.S. LIMBERED WAGON FOR INFANTRY MACHINE GUN SECTION — *continued.*

Articles.	No.	Approximate Weight. lbs.	Approximate Weight. ozs.	Where carried.
Drum, oil, 3 galls., with bung (containing spare supply of water)	1	37	8	As shown.
Flannelette ... ... yds.	6	—	4	With clinometer.
Guns — Maxim and Vickers, protectors, muzzle	1	—	3	In case with gun.
Guns — Vickers — ·303-inch, complete (in leather case, with cleaning rod and spare gun barrel)	1	70	—	In case as shown (casing filled with water)
Guns — Vickers — plug, cork, complete ...	1	—	1	In case as shown (casing filled with water)
Hooks, bill	1	2	0	Between gun case and near side of wagon.
Lamps, siege, candle with stand (in box) ...	2	12	10	In box as shown.
Linen, old (for cleaning) ... ... lbs.	1	1	0	With flannelette round clinometer.
Mallet, heel peg	1	2	8	
Mountings, tripod — ·303-inch Maxim gun, Mark IV, complete (with hood, projecting)	1	59	0	
Mountings, tripod — pins, joint — crosshead ...	1	—	10	As shown.
Mountings, tripod — pins, joint — elevating ...	1	—	5	As shown.
Muzzle attachment, for ball firing	1	1	7	In case with gun.
Plug, belt, Maxim, ·303-inch	1	—	4	In case with gun.
Reflector, mirror, M.G., ·303-inch	1	—	1	Rolled in with clinometer.
Rifle of driver	1	8	15	
Shovel, G.S.	1	3	8	As shown.

HIND PORTION.				
Axes, pick — head	1	4	8	Loose in bottom of wagon.
Axes, pick — helve	1	3	4	Loose in bottom of wagon.
Bags, sand, common	15	8	14	In near fore portion under lamps siege.
Bar, carrying Maxim gun on tripod	1	1	10	In bed of wagon.
Belts, ammunition, Maxim, ·303-inch (in boxes) (*a*)	14	271	0	10 along off side bed. 4 on top off fore corner.
Blanket, saddle (*b*)	1	5	4	Round saddle.
Box, spare parts and implements, Vickers (filled)	1	20	0	In middle of bed of wagon as shown.
Box, dubbing, 1 lb. (filled)	1	1	8	
Cans — lubricating, No. 9 (*c*)	2	1	10	In cases under seat.
Cans — half-pint (*d*)	2	—	14	In cases under seat.
Cases, cans, ·303-inch, tripod mountings ...	1	2	3	As above.
Clinometer, field (in case)	1	2	8	In corner next siege lamp, as shown.
Condenser, steam	1	2	4	
Drum, oil, 3-galls., with bung (containing spare supply of water)	1	37	8	Under seat.
Guns — Maxim and Vickers, protector, muzzle	1	—	3	
Guns — Vickers — ·303-inch, complete (in leather case, with cleaning rod and spare gun barrel)	1	70	0	In case with gun. Fore and aft along bed of wagon in middle.
Guns — Vickers — plug, cork, complete ...	1	—	1	In case with gun. Fore and aft along bed of wagon in middle.
Hook, bill	1	2	0	In bed of wagon.
Lamps, siege, candle, with stand (in box) ...	2	12	10	In near fore corner as shown.
Luggage, saddle, with appurtenances, &c., as shown in Infantry F.S. Manual ...	1	43	4	In blanket, saddle, as shown.

(*a*) Each belt contains 250 rounds, S.A.A.
(*b*) For the off-horse.
(*c*) One for mineral oil, one for oil, lubricating, G.S., packed in the case, can, ·303-inch.
(*d*) One for oil, lubricating, G.S.; one for turpentine, packed in the case, can, ·303-inch.

STORES CARRIED IN G.S. LIMBERED WAGON FOR INFANTRY MACHINE GUN SECTION—*continued.*

Articles.	No.	Approximate Weight. lbs.	Approximate Weight. ozs.	Where carried.
Machine, filling belts, Maxim, ·303-inch, Mark II (in chest) (*f*)	1	42	0	In off hind corner.
Mountings, tripod { ·303-inch, Maxim gun, Mark IV, complete (with hood, protecting)	1	59	0	Athwart floor at rear of wagon.
{ crosshead	1	—	10	
{ pins, joint	1	—	5	
{ elevating gear	1	1	7	
Muzzle attachment for ball firing ...	1	—	1	In case with gun.
Reflector, Mirror, M.G., ·303-inch	1	—	8	
Shovel, G.S.	1	3		
Load	—	1,114	12	(Kits as shown.)
G.S. limbered wagon equipped with spare parts and wagon equipment stores ...	—	1,272	15	
Total loaded G.S. limbered wagon.	—	2,387	11	= 22-cwt. (about).

N.B.—In addition to above, the packs of Nos. 1, 2, 3 and 4 of Infantry machine gun detachments will be carried in the hind portion of the limbered wagon.

(*f*) The chest is carried loose in the vehicle, and the machine is clamped to the perch for use. 4 spare springs, action lever and 2 spare springs, pawl, are also in the chest.

PACKSADDLERY, MACHINE GUN, ·303-INCH.

Mark IV Tripod.

The packsaddlery for use with equipments supplied with the above Mark of Tripod will be as follows :—

Description.	Per gun and tripod set.	Per ammunition set.	Weight of each article.
Section No. 5A.			lbs. ozs.
HARNESS, POLE-DRAUGHT, G.S.			
Cases, horse-shoe, harness	1	1	1 0
Section No. 5B.			
PACKSADDLERY, G.S.			
Bits, bridoon	1	1	0 14
Breechings, Mark III, IV or V ...	1	1	1 11
Chains, collar, G.S., Mark III... ...	1	1	2 6
Collars, breast, Mark III, IV or V ...	1	1	1 4
Collars, head, Mark III or IV ...	1	1	1 15
Cruppers, Mark V	1	1	0 10
Girths, Mark III, IV or V pairs (*a*)	1	1	1 9
Girths, leather, Mark I (*b*)	—	1	0 11

(*a*) As Mark V girths are not held on charge in pairs, 2 single girths will be required with each tree. Tanned worsted girths will be issued to Cavalry.

(*b*) When "racks Mark II" (canvas) are issued, 1 "girth, leather" will be required. When "racks, Mark I" are used, the "girth, web, racks and hangers" is used with it. It is not suitable for the Mark II rack; neither is the "girth, leather," suitable for the Mark I rack.

PACKSADDLERY, MACHINE GUN, ·303-INCH.—*continued.*

Description.	Per gun and tripod set.	Per ammunition set.	Weight of each article. lbs. ozs.
Pannels, Mark IV (small) or Mark V ... ... pairs (*c*)	1	1	11 0
Reins, bridoon (*d*)	1	1	0 12
Straps, girth, Mark II	4	4	0 4½
Surcingles, Mark III	1	1	2 2
Trees, adjustable	1	—	7 4
PACKSADDLERY, MACHINE GUN, ·303-INCH.			
Bottles, water	1	—	6 8
Caps, shovel, Mark II	—	1	0 11
Frames, wood, Mark II	1	1	4 0
Girths, web, racks and hangers, Mark II (*d*)...	1	1	1 0
Hangers, gun, adjustable tree ...	1	—	12 7
Block, arm	1	—	0 8
Strap, steadying...	1	—	0 5
Hangers, tripod, adjustable tree ...	1	—	11 11
Rack, boxes, ammunition in belts { Mark I (*e*) or Mark II (*e*) ...	—	2	15 1 4 12
Straps, girth (*f*)	4	4	0 1½
Trees, small, converted	—	1	11 12

(*c*) 1½ lbs. of horse hair will be issued with each pair of new pannels. This should be put under the quilted parts, if necessary, after the pannels have been worn a short time.

(*d*) Reins, bit, will be issued to cavalry.

(*e*) When "racks Mark II" (canvas) are issued 1 "girth, leather," will be required. When "racks, Mark I" are used, the "girth, web, racks and hangers" is used with it. It is not suitable for the Mark II rack; neither is the "girth, leather," suitable for the Mark I rack.

(*f*) For "girths, web, racks and hangers" only.

The Loads will be distributed as under—

Near side.	Weight. lbs. ozs.	Off side.	Weight. lbs. ozs.	Top load.	Weight. lbs. ozs.
Tripod, Mark IV.	47 0	*Gun with water chamber filled.	38 8	Box, spare parts when carried.	20 0
Spare barrel and cleaning rod. (Figure 4.)	5 8	†Water bottle filled ... ... (Figure 3.)	21 0	(Figure 4.)	

Weights.

* Gun (without water) ... ... 28½ lbs.
† Bottle, water (empty) ... ... 6½ lbs.

Animals with abnormal broad hips are unsuitable for carrying machine guns with tripods.

If more padding is required (see footnote *c*, p. 76) to place the tripod legs clear of the animal's side, one or more layers of brown felt laced on the bearing bar of the tripod hanger should be employed; small leather pockets may be sewn to the felt for securing them to the bar, in place of laces, and to form a pannel.

In very special cases a thin plaited straw mat may be worn between the felt and bearing bar, by this means the tripod can be thrown out to any position.

The tripod can be placed so that the feet are above the animal's back by placing one or two legs above the point of the hanger. The weight is not affected thereby.

The spare gun barrel and cleaning rod should be carried underneath the tripod, *i.e.*, between it and the saddle.

Hanger gun, adjustable tree.† (*Figure* 1.)

This is made of steel and formed with eyes for hooking on to the hooks of the saddle arches.

The bottom of each arm is shaped and covered with leather to fit the gun.

The arms are connected at the bottom by a cranked stay rod, and at the top by an upper stay rod and a steel bar for the carriage of the tool box or water bottle, whichever may be necessary to balance the load.

A wooden bearing bar is attached to, and works automatically on knuckle joint hinges riveted to the dee plates.

The hanger is fitted with two straps to secure the gun, one 18 inches and one 16 inches in length, and with two buckle pieces, and a bag hide gun cover.

The steel bar brackets have two straps attached, each 37 inches in length, to buckle over the saddle to the tripod hanger, to secure the top load, box, or water bottle.

The arm block and steadying strap are provided to allow of this pattern machine gun being carried in the service gun hanger. The former article is a shaped leather block on a steel foundation, and is designed to prevent the casing of fusee spring resting on the point of arm. It is fitted with a buckle and strap for securing it to the bottom of the arm of the hanger. The steadying strap is fitted with a quick release attachment to prevent movement of the gun whilst in the hanger. It is first buckled round the "dee" shaped portion of the rear arm of the hanger, and the rapid release end of the strap fits round the place where the gun is secured in the cross-tree head.

† These articles must never be thrown down on the ground when unsaddling, but should be removed carefully from the animal's back and placed on the ground.

Hanger tripod, adjustable tree.† (*Figure* 2.)

This is similar to the "hanger, gun," except that the bottom of the arms are curved differently to suit the various tripods.

The wooden bearing bar is set ¾ inch further away from the rear arm than from the front one, to cause the rear portion of tripod to clear the animal's hip.

It is fitted with two buckle pieces, and two straps, one 20¼ inches and one 17½ inches to secure the tripod, and with two buckle pieces on the bar brackets, to take the box straps of the gun hanger.

The water bottle straps are detachable, they are 36 inches in length, having loop short pieces 9 inches from buckles to secure them to the hanger. They may be worn on the steel bar, or on the stay rod, or on the gun hanger, as may be required for the position of the water bottle.

Girth.

This is of 4-inch tan worsted web, similar to the saddle girth Mark V (§12462), except that it is of worsted web instead of hemp. It is 33½ inches in length exclusive of chapes, and fitted with a tinned iron dee and two chapes with buckles at each end.

Tree adjustable.†

This saddle and its parts are much lighter than previous patterns, and are intended to reduce the weight carried.

The arches of the saddle are jointed to the side bars to admit of their turning automatically, to adjust themselves to the backs of large or small animals, and to meet the loss in the condition of the latter which takes place on active service.

It also obviates the necessity of several patterns and sizes.

† These articles must never be thrown down on the ground when unsaddling, but should be removed carefully from the animal's back and placed on the ground.

Fig. 1.

HANGER, GUN, ADJUSTABLE TREE.

CARRIED ON OFF SIDE.

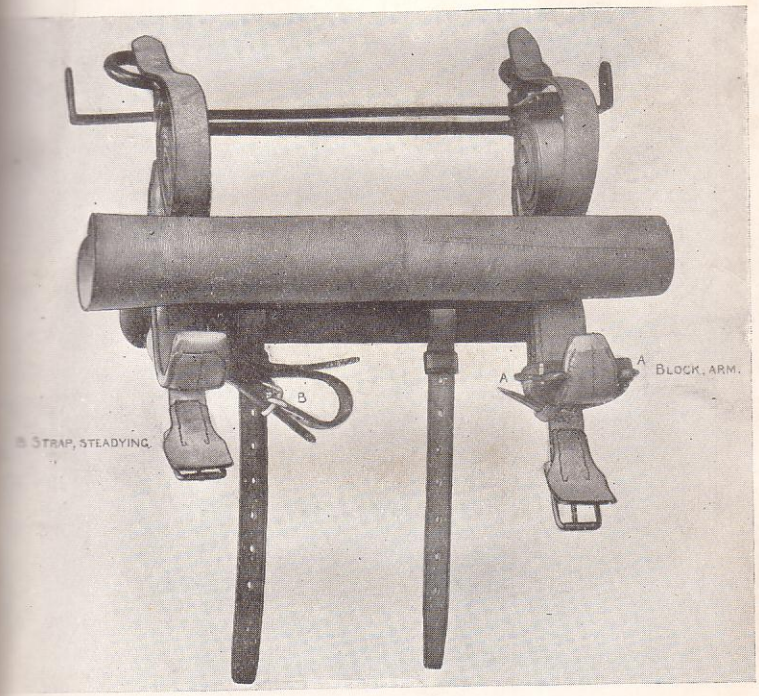


Fig. 2.

HANGER, TRIPOD, ADJUSTABLE TREE.

CARRIED ON NEAR SIDE.

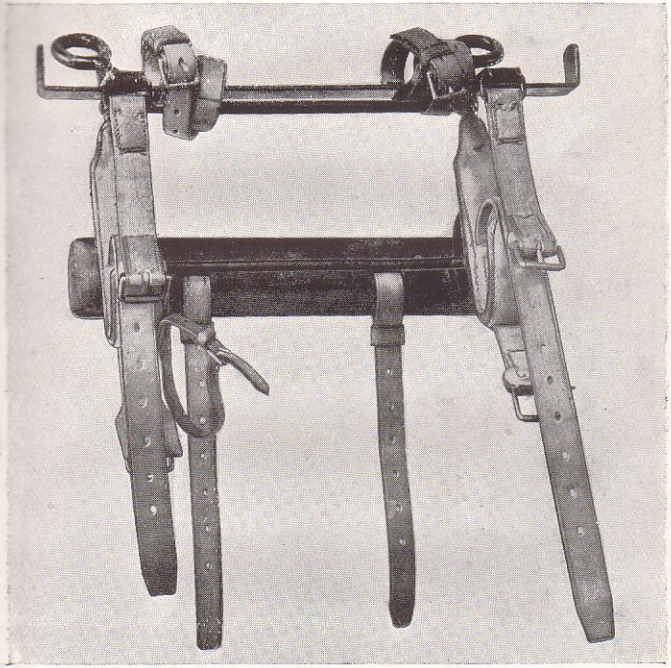


Fig. 3.

·303 VICKERS MACHINE GUN IN HANGER.

(Showing Method of Carrying Water-Bottle.)

(Off Side.)

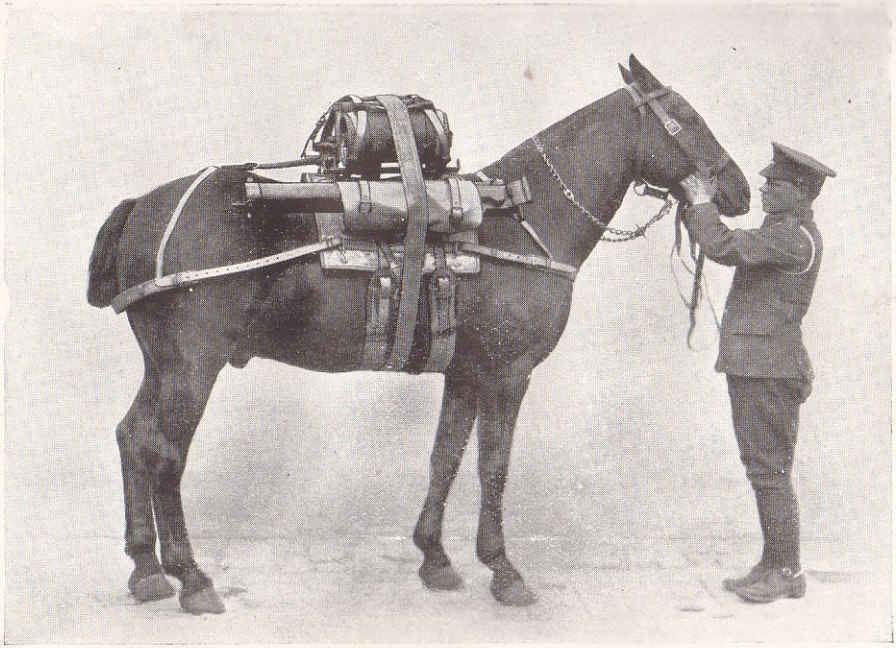


Fig. 4.

TRIPOD MARK IV IN HANGER.

(With Case, Spare Parts, on Top of Saddle.)

(Near Side.)

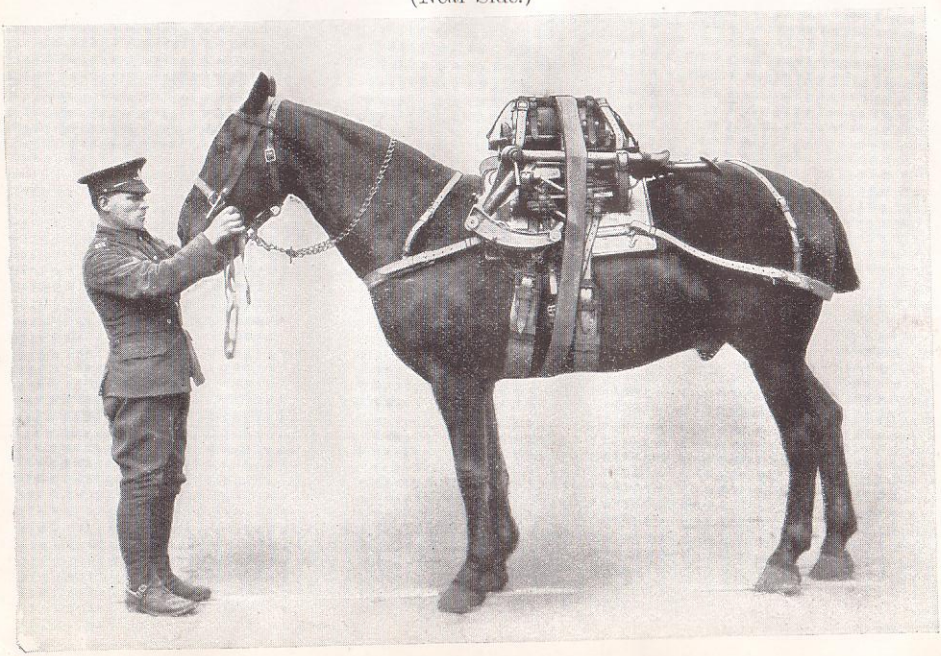
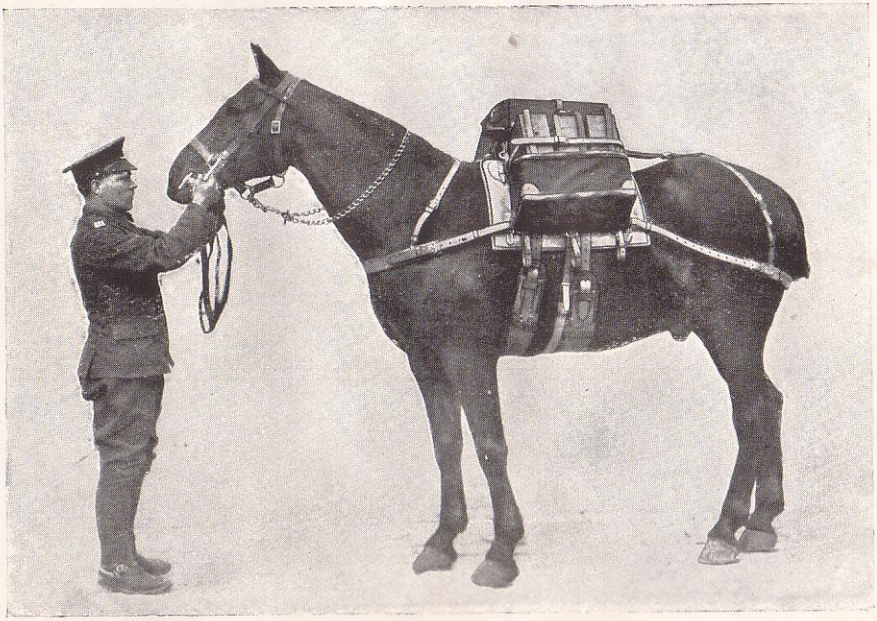


Fig. 5.

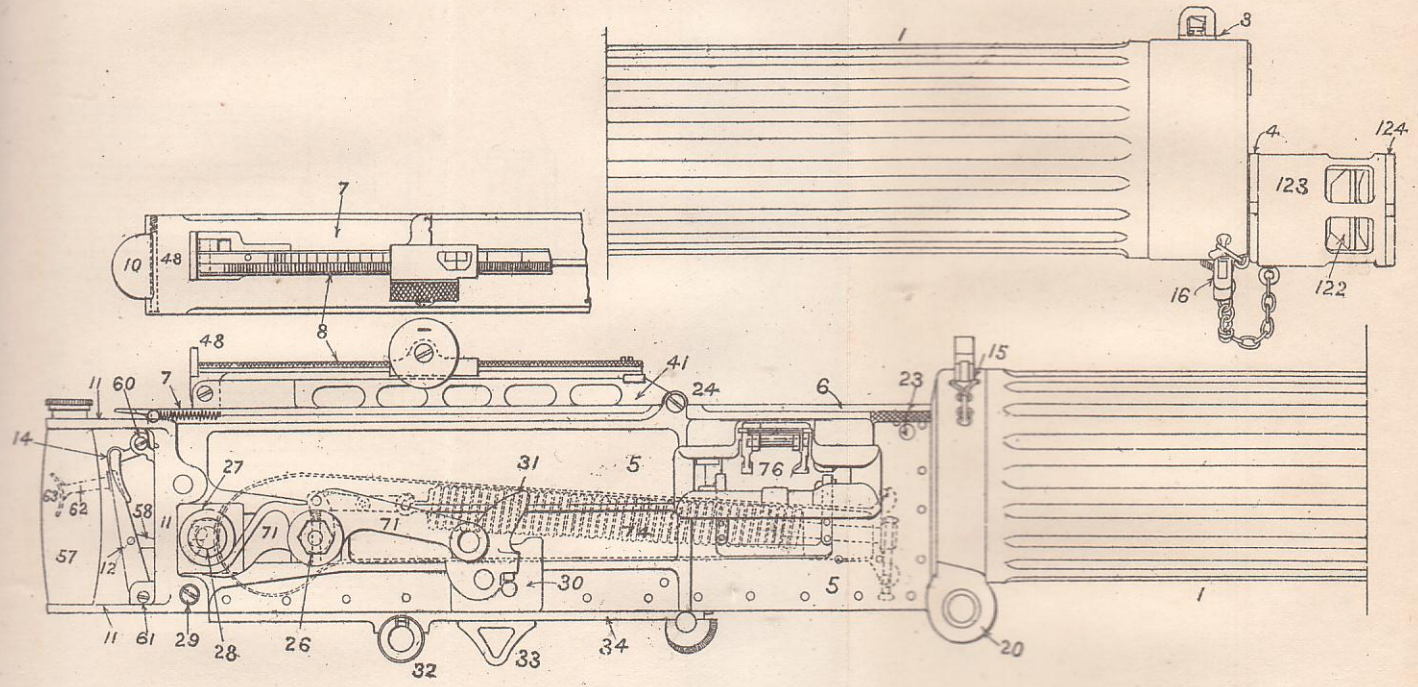
AMMUNITION RACK (MARK II) WITH BELT BOXES.

(For illustration reasons the surcingle is not shown.)



VICKERS GUN.

Plate I.



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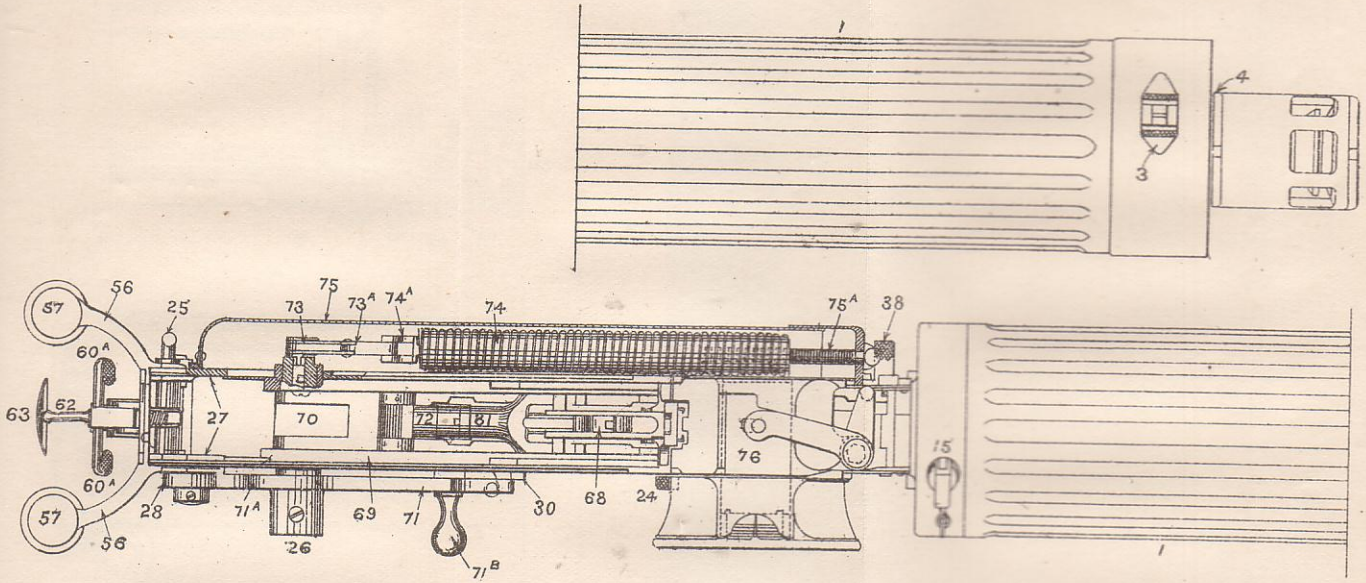
Malby & Sons. Lith.

VICKERS GUN.

Plate II.



3225.

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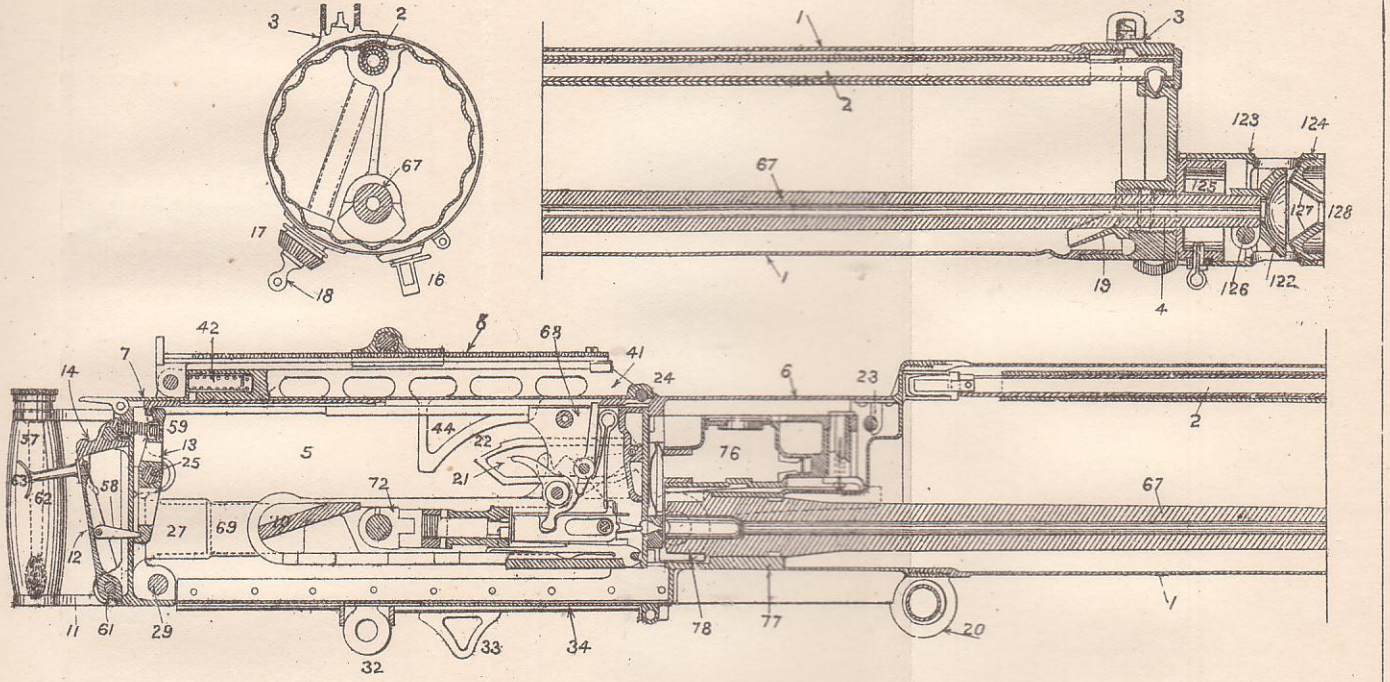
VICKERS GUN.

Plate III.



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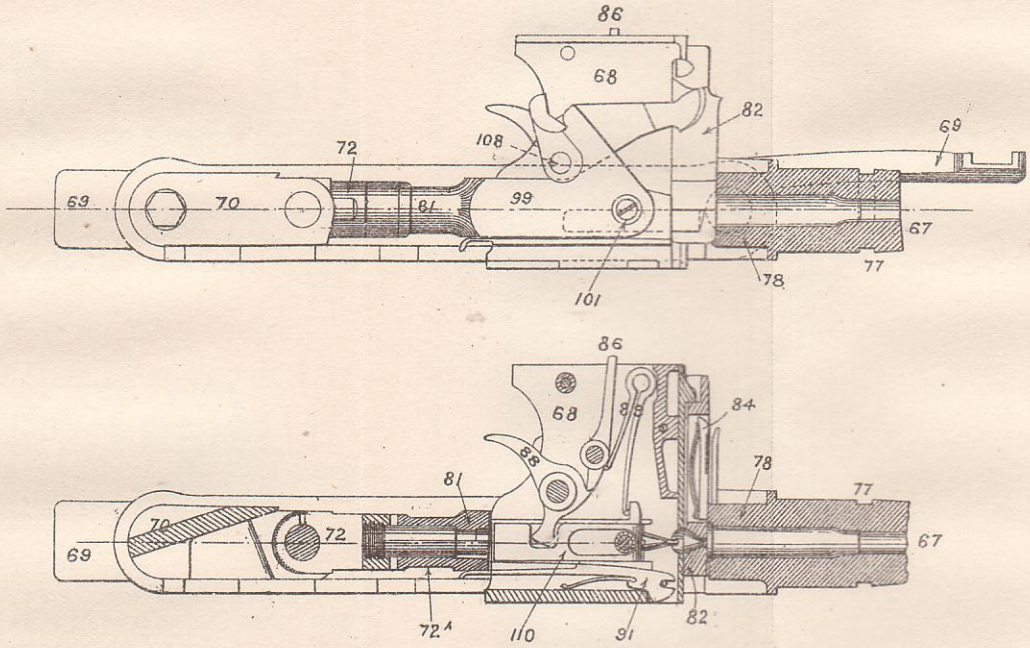
VICKERS GUN.

Plate IV.

RECOILING PORTION OF GUN.



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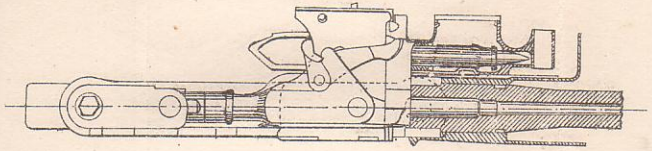
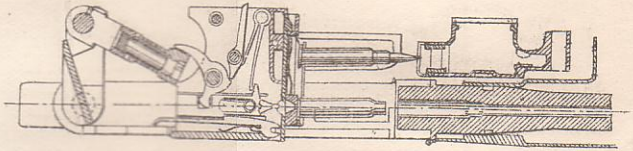
VICKERS GUN.

Plate V.

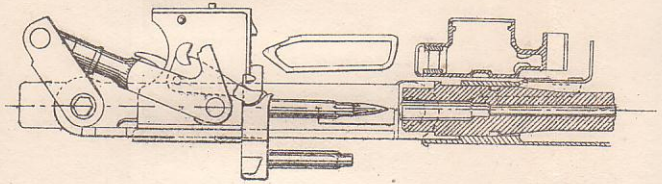
WORKING POSITIONS OF LOCK.



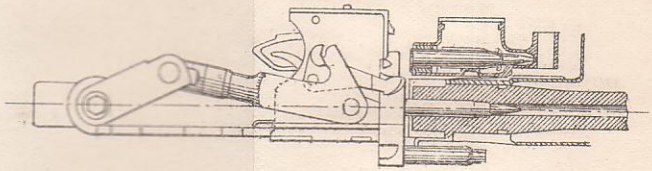
Lock fully home and just fired. Extractor engaging with empty case in chamber and cartridge in feed block.



Lock and barrel recoiling. Extractor withdrawing empty case from chamber and a cartridge from the feed block. firing pin cocked and safety sear engaging.



Lock in nearly fully recoiled position. Barrel returning. Extractor down, brings cartridge in line with chamber and empty case either falls off or is pushed off when extractor rises.



Lock returning, barrel home, extractor being raised by levers, leaving empty case to be ejected, cartridge in chamber, and about to engage with another in the feed block

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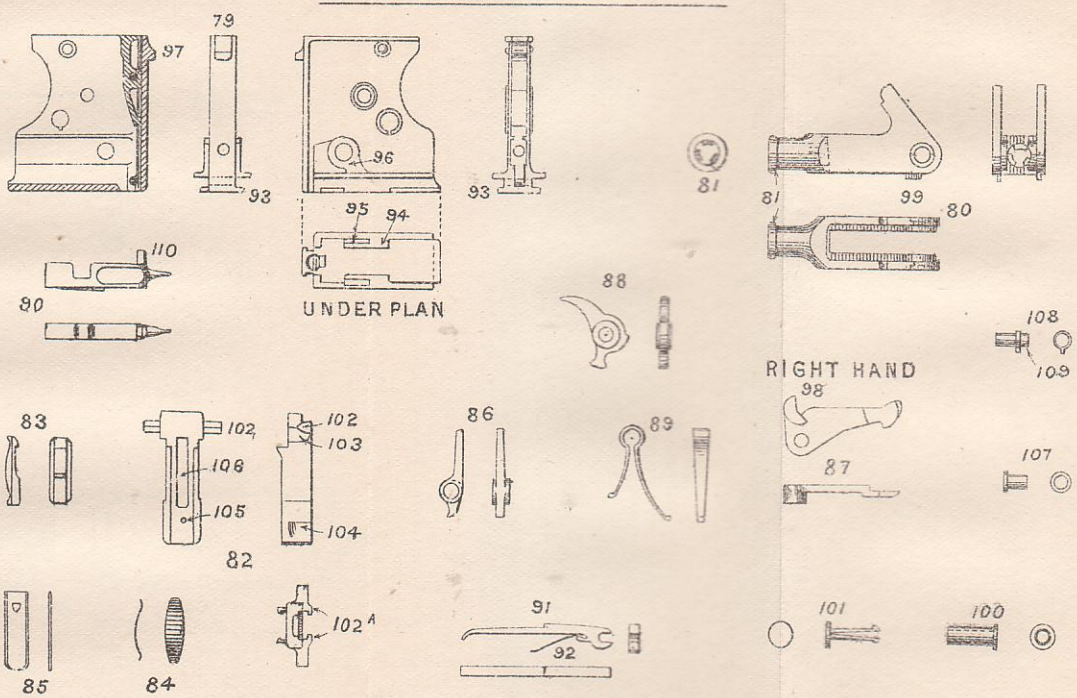
VICKERS GUN.

Plate VI.

PARTS OF THE LOCK.



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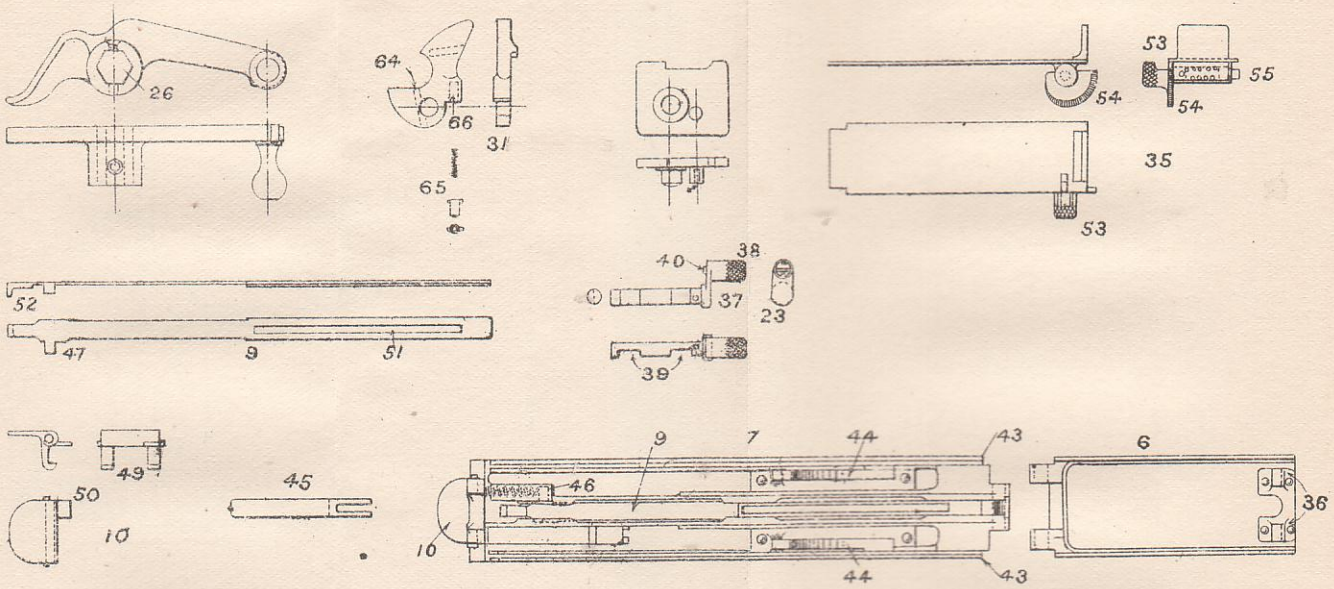
VICKERS GUN.

Plate VII.



3225.

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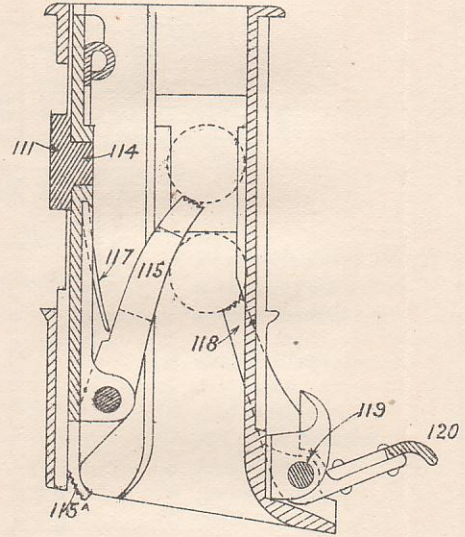
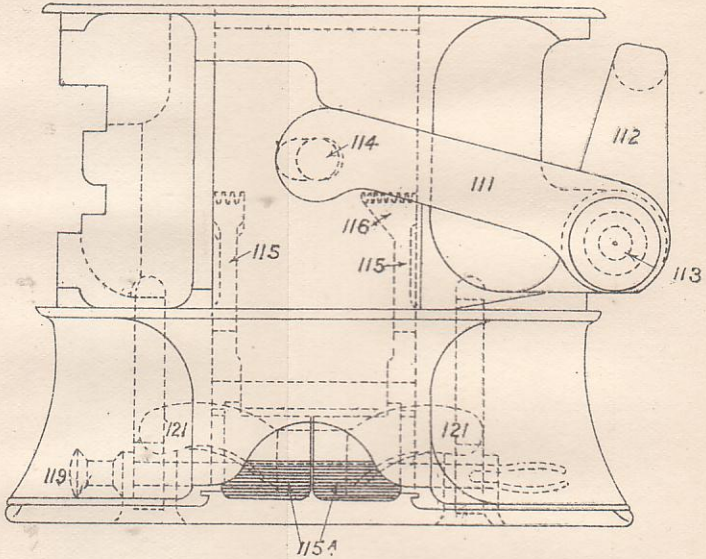
VICKERS GUN.

FEED BLOCK.





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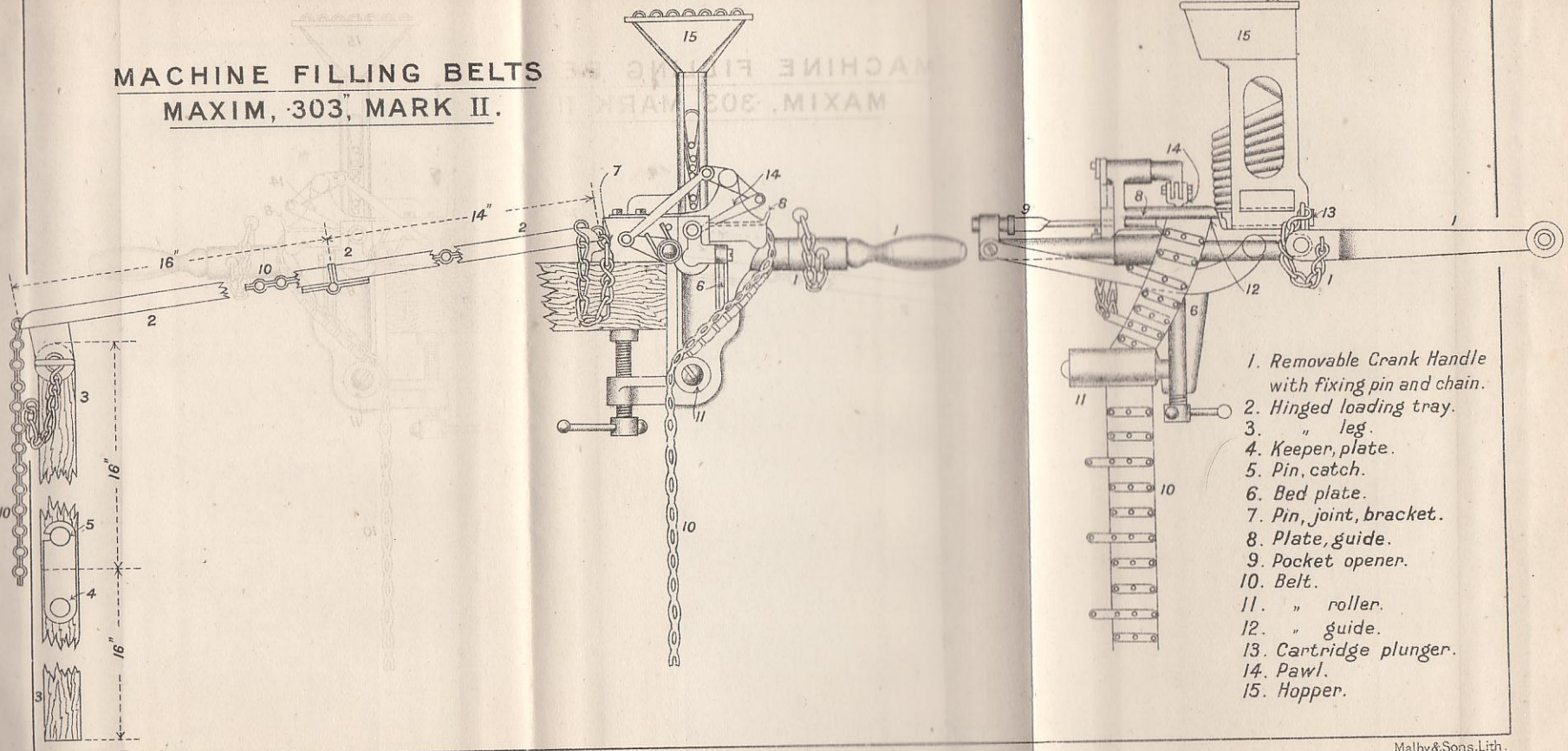
MACHINE FILLING BELTS
MAXIM, ·303", MARK II.



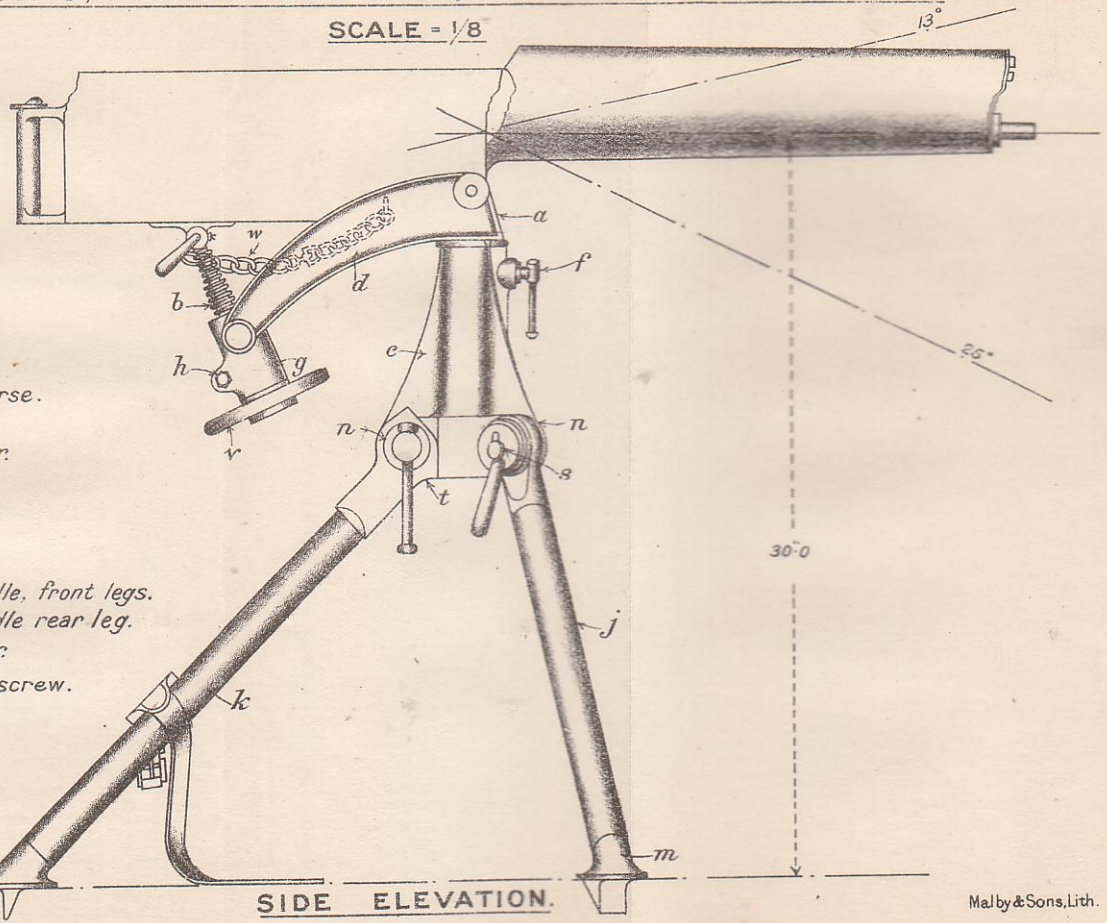
1. Removable Crank Handle with fixing pin and chain.
2. Hinged loading tray.
3. " leg.
4. Keeper, plate.
5. Pin, catch.
6. Bed plate.
7. Pin, joint, bracket.
8. Plate, guide.
9. Pocket opener.
10. Belt.
11. " roller.
12. " guide.
13. Cartridge plunger.
14. Pawl.
15. Hopper.

Malby&Sons, Lith.

MOUNTING, TRIPOD. 303 INCH, MAXIM GUN MARK IV.

Plate X

SCALE = 1/8



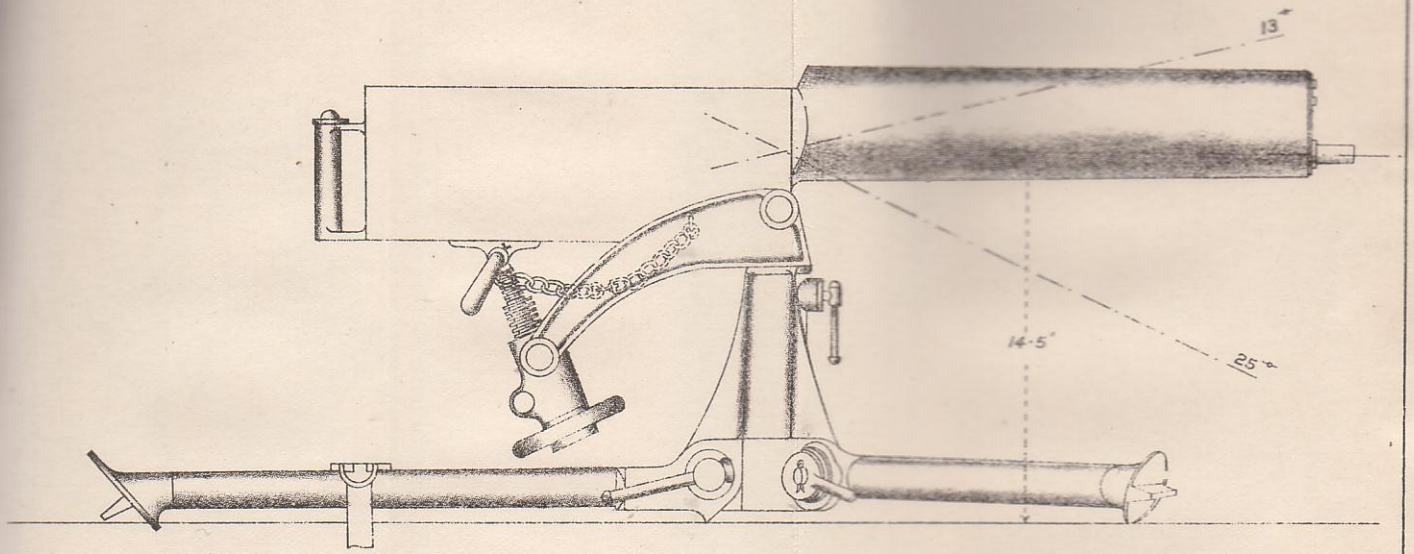
a. Crosshead.
b. Elevating gear.
c. Socket.
d. Arm, crosshead.
f. Screw, clamp, checking traverse.
g. Tumbler, elevating gear.
h. Bolt, jamming, elevating gear.
j. Front legs.
k. Rear leg.
m. Shoes.
n. Socket lugs.
s. Stud, joints, and jamming handle, front legs.
t. Joint pin and jamming handle rear leg.
v. Handwheel elevating gear.
w. Chain, securing elevating screw.

SIDE ELEVATION.

Malby & Sons, Lith.

MOUNTING, TRIPOD, ·303 INCH, MAXIM GUN, MARK IV.

SCALE 1/8.



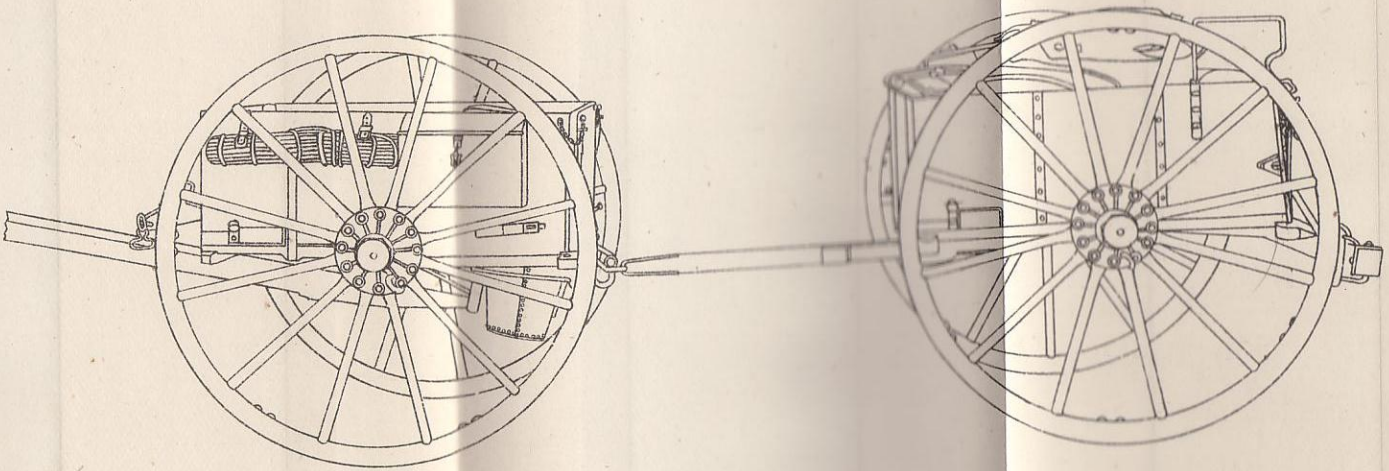
SIDE ELEVATION.

Malby & Sons, Lith.

WAGON, LIMBERED, G. S.

PACKED FOR CAVALRY MACHINE GUN SECTION.

SCALE ABOUT 1/24.

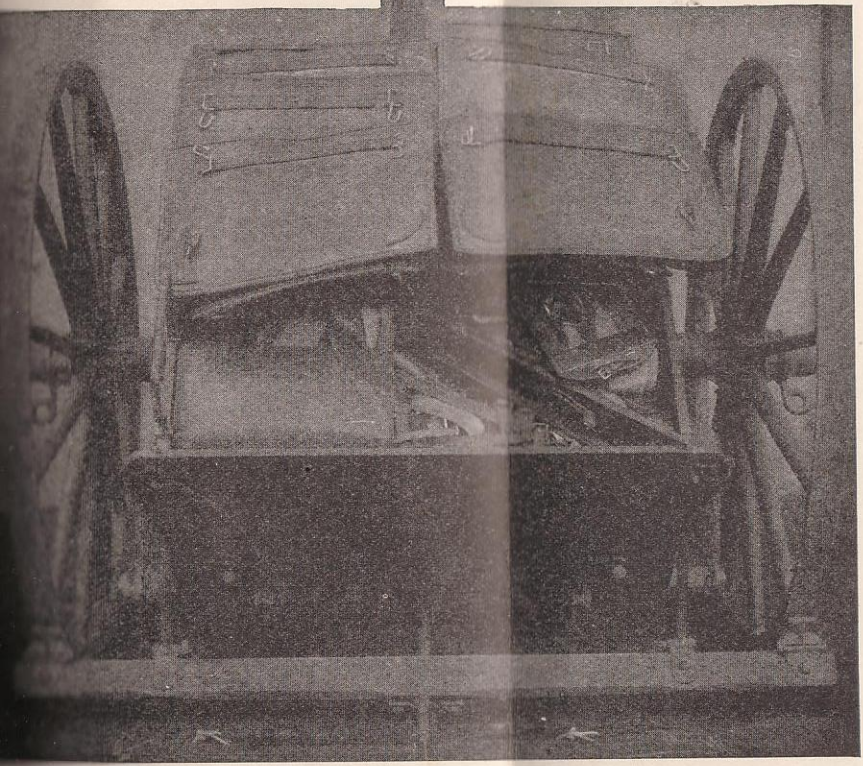


Malby & Sons, Lith.

AGON, LIMBERED, G.S.
Hind Portion.
Scale = about $\frac{1}{14}$.

Plate XIV.

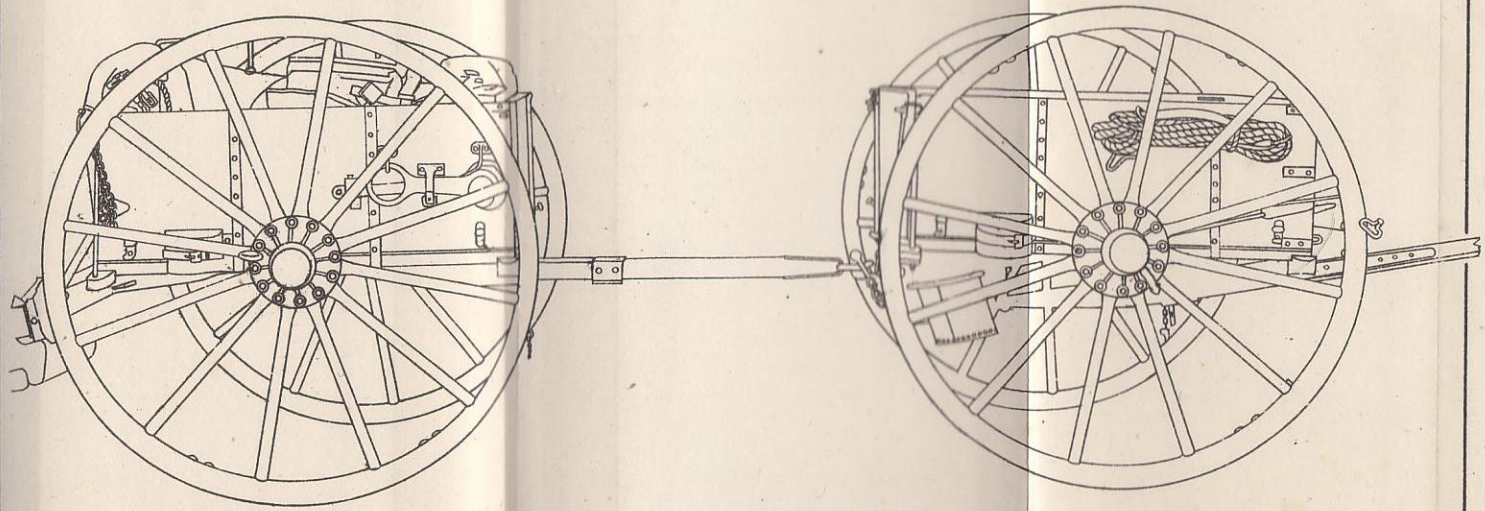
PACKED FOR CAVALRY MACHINE GUN SECTION.



WAGON, LIMBERED, G. S.

PACKED FOR INFANTRY MACHINE GUN SECTION.

SCALE = ABOUT 1/24.



Malby & Sons, Lith.

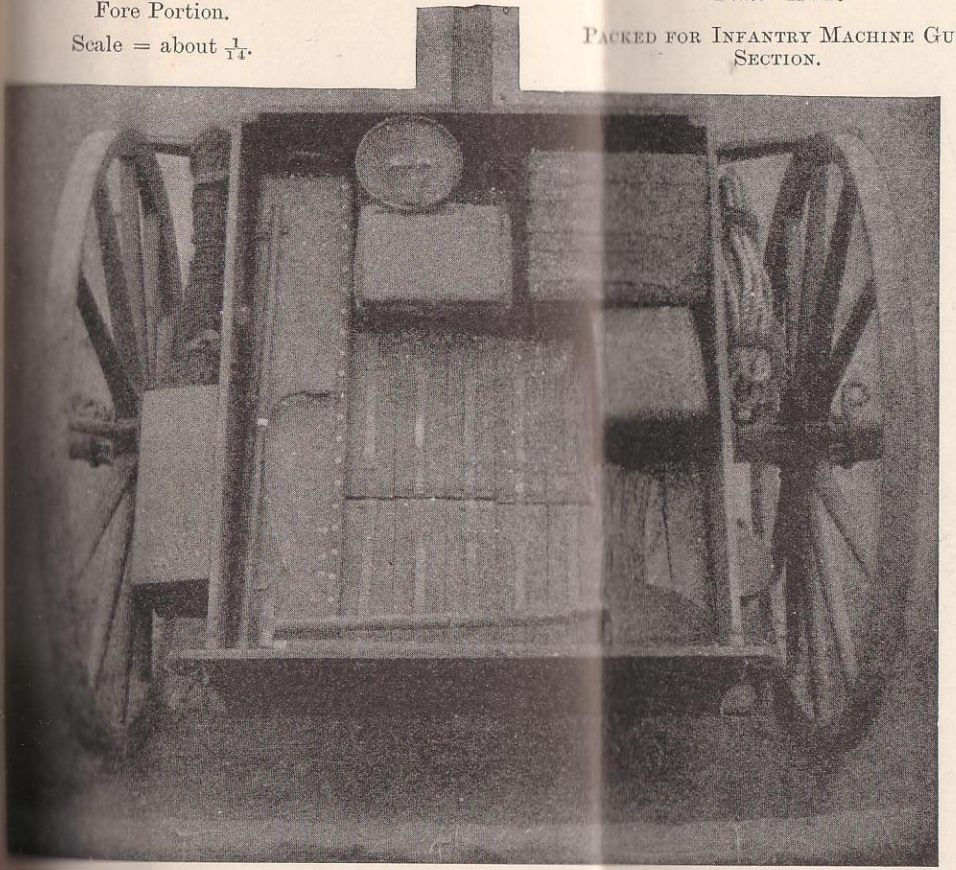
WAGON, LIMBERED, G.S.

Fore Portion.

Scale = about $\frac{1}{14}$.

Plate XVI.

PACKED FOR INFANTRY MACHINE GUN SECTION.



(As to prices in brackets, see top of page 2.)

Medical Service. Strategical and Tactical Employment of the, as carried out in an Army Corps; with a series of Problems. Translated from the Austrian. 4*s*. 6*d*. (3*s*. 4*d*.)

Medical Services. Army. Advisory Board for. The treatment of Venereal Disease and Scabies. First Report. 1904. 1*s*. 6*d*. (1*s*. 3*d*.); Second Report. 1905. 2*s*. (1*s*. 6*d*.); Third Report. 1905. 1*s*. (10*d*.); Final Report. 1906. 6*d*. (5*d*.)

Medical Services of Foreign Armies. Handbook of. Part I. FRANCE. 6*d*. (5*d*.) (*Under revision*); Part II. GERMANY. 6*d*. (5*d*.); Part III. AUSTRIA-HUNGARY. 6*d*. (5*d*.); Part IV. RUSSIA. 6*d*. (5*d*.); Part V. ITALY. 6*d*. (5*d*.); Part VI. THE NETHERLANDS AND BELGIUM. 1911. 6*d*. (5*d*.)

Mekometer Handbook. 1912. 6*d*. (6*d*.)

Military Lands Acts 1892 to 1903. Byelaws. (*See* Artillery and Rifle Ranges Act, &c.)

Mobilization Regulations. 1912. 6*d*. (6*d*.); Amendments. July 1913. 1*d*. (1*d*.)

Musketry Regulations:—

Part I. 1909. (Reprinted, with Amendments, 1914.) 6*d*. (7*d*.)

Part II. Rifle Ranges and Musketry Appliances. 1910. (Reprinted, with Amendments to Oct. 31, 1914.) 4*d*. (4*d*.)

Night Operations. Elementary Training in. 1911. 1*d*. (1*d*.)

Number of Troops to the Yard in the Principal Battles since 1850. Memo. on. With opinions of Modern Authorities on limits of extension at the present day. 1884. 9*d*. (7*d*.)

Nursing in the Army. Queen Alexandra's Imperial Military Nursing Service. *Reprinted from* "The British Medical Journal." 1905. 1*d*. (1*d*.)

Nursing Service. Queen Alexandra's Imperial Military. Regulations for Admission to the. 1914. 1*d*. (1*d*.)

Officers Training Corps:—

Regulations. 1912. 2*d*. (2*d*.) (*Under revision*)
Do. Appendix III. (*In the press*)
Do. (Inns of Court). 1*d*. (1*d*.) (*Under revision*)
Special A.O. March 16, 1908. 1*d*. (1*d*.)
Junior Division. Instructions for the Annual Camps. 1913. 2*d*. (2*d*.)

Operation Orders. A Technical Study, by Hans von Kiesling. Translated from the German. 1*s*. 6*d*. (1*s*. 3*d*.)

Optical Manual or Handbook of Instructions for the Guidance of Surgeons. Third Edition. 1885. 1*s*. 6*d*. (1*s*. 3*d*.)

Optics. Notes on. 6*d*. (5*d*.)

Orange Free State. Topographical Survey of the, 1905-1911. Report on the. 10*s*. (7*s*.)

Ordnance College (*and see* Artillery College):—

Advanced Classes (up to the 33rd). Reports on. Each 1*s*. (9*d*.)
Do. 34th. 6*d*. (5*d*.)
Dynamics. Notes on. Second Edition. 3*s*. (2*s*. 5*d*.)

(As to prices in brackets, see top of page 2.)

Ordnance College—*continued.*

Officers' Mess (Royal Artillery) Management and First Principles of Bookkeeping. 3*d.* (3*d.*)

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Regulations. 1907. 2*d.* (2*d.*)

Ordnance Corps. Army. Standing Orders. 1912. 6*d.* (6*d.*)

Ordnance Manual (War). 1914. 6*d.* (5*d.*)

Ordnance Service. Treatise on. Seventh Edition. 1908. With volume of plates. 7*s.* 6*d.* (5*s.* 6*d.*); Amendments. June 1909, Dec. 1910, Dec. 1912. Each 1*d.* (1*d.*); Do., Dec. 1909 Dec. 1911. Each 2*d.* (2*d.*)

Ordnance Services. Army. Regulations:—

Part I. 1912. [Reprinted, with Amendments, 1914.] 6*d.* (6*d.*)

(*In the press*)

Part II. 1914. Instructions for Laboratories and Laboratory Operations, Examination of Explosives and Ordnance. 1*s.* (11*d.*)

Pathological Specimens in the Museum of the Army Medical Department, Netley. Descriptive Catalogue of. Third Edition. Vol. I. By Sir W. Aitken, M.D. 1892. 5*s.* (3*s.* 8*d.*)

Pay Duties of Officers Commanding Squadrons, Batteries, Companies, &c. Instructions. 1914. 1*d.* (1*d.*)

Physical Training. Manual of. 1*s.* (11*d.*)

Do. Amendments. July 1913. 1*d.* (1*d.*); Dec. 1914 (*In the press*)

Place-Names occurring on Foreign Maps. Rules for the Transliteration of. 1906. 1*s.* (9*d.*)

Portable Sub-target (Mark I.), and How to Use it. 1911. [Reprinted, with Amendments, 1914.] 1*d.* (1*d.*)

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